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ABSTRACT

This book reports on a study of the implementation of the 1995 Mathematics Curriculum Framework conducted by the Massachusetts Teachers Association's Center for Educational Quality and Professional Development (CEQ). It examines whether schools and districts provide students with the curriculum and instruction necessary to succeed on the Massachusetts Comprehensive Assessment System (MCAS) Mathematics Test. This study concludes that in the process of implementing elements of education reform, teachers and principals have been marginalized by the state agency. (KHR)

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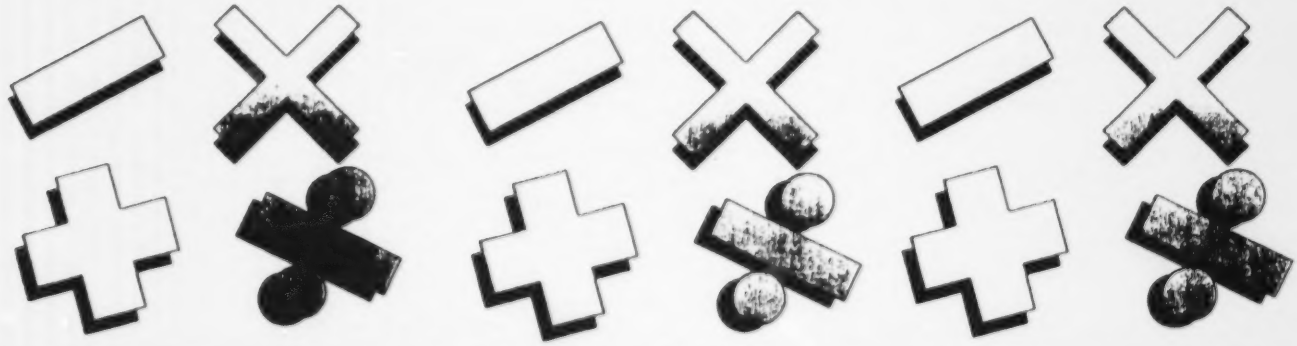

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Charles Gobron, Chairperson of the MTA Professional Development Council, read every draft of this study with a solid blue pencil without complaint and always identified areas for correction and clarification. My spouse – and retired mathematics teacher – Phil Pratt shared his mathematics expertise and insightful comments through every draft.

Finally, my predecessor and mentor, Fred Andelman, who gave me hours of his precious time and guidance through thoughtful and provocative dialogue even as he engaged in a battle for his life.

MTA may be viewed as a partisan player on this issue. BUT it should be clearly understood that no single group of "players" has a greater interest in making the promise of education reform a reality for every child in our public schools than the educators - teachers, administrators, paraprofessionals, support staff - who work every day with students in their classrooms, schools and districts. MTA is a complex organization: one that focuses on policy and practice; on work rules and state regulations; on the professional needs of teachers and the learning needs of students. Above all, MTA is the voice of and for classroom teachers who aren't available to speak directly because they are busy teaching.

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What it Takes

Imagine a very large school system that has been focusing on basic skills instruction for some years. The focus has been spurred in part by a high stakes test of basic skills. It is assumed that 80-90% of teachers have been covering the basic skills in their instruction.

In light of current educational reform ideas, the system decides that it needs to move beyond basic skills teaching to focus in the future on problem solving, higher order thinking skills, making inferences and drawing conclusions.

In light of this situation, and your expertise in studying school reform, my two questions to you are these:

1. How long would it likely take for this large school system to shift from having 80-90% of teachers teaching basic skills to having 80-90% of teachers teaching the more advanced skills?

2. What would be the key ingredients required to make such a shift in instruction possible in the time you envision in your answer to the first question?

Walt Haney

Dear Walt....

Those are tough questions, difficult to answer in the abstract. Much depends on the intellectual power of the faculty in this large high school. Nonetheless, some hunches:

It will take at least five years (and some big professional development bucks) to shift your large school so that at least over half the classes are "beyond rudimentary thinking." Two steps are involved: making sure that teachers themselves know and value what demanding intellectual work is; and preparing them as scholars to be able to teach toward it.

Key ingredients?

- *Professional development time, in the disciplines, in pedagogy and in the ways and means of appropriate assessment.*
- *Student loads per teacher of sixty or fewer pupils (one must really know each kid's mind well...).*
- *Longer, flexible class time.*
- *Time every day for "teacher talk"-- that is, consultation among the staff.*
- *Simpler curriculum to allow for deeper work.*

All this can be done. I have seen it done. All that is required is determination, political courage, money (time), dogged persistence and higher authorities who don't constantly jerk the school around.

Ted Sizer

Source: Haney, W. (2000). The myth of the Texas miracle in education. Used with the author's permission.

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A Massachusetts Teachers Association Research Study

November 2000

Executive Summary

The Massachusetts Teachers Association's Center for Educational Quality and Professional Development (CEQ) conducted this study of the implementation of the 1995 Mathematics Curriculum Framework at the local school district level to examine the question:

Are schools and districts providing students with the curriculum and instruction necessary to succeed on the MCAS Mathematics test? If so, how far have they gone? If not, why not?

Given the high stakes for students, teachers, schools and districts that the Commonwealth has attached to student performance on MCAS, it is essential that educators and policy makers understand the degree of actual implementation to date of the curriculum on which the test is based. In order to implement the Mathematics Curriculum Framework, districts needed to align their curriculum with the state standards, adopt compatible textbooks, and provide mathematics teachers with the accompanying professional development focused on standards-based curriculum, instruction and assessment.

Findings

This study reports that in the process of implementing elements of education reform, teachers and principals have been marginalized by the state agency. Educators' professional judgment has been replaced by that of individuals with little or no working knowledge of the operations of schools and school districts. Collaboration and professional sharing between the Massachusetts Department of Education (MDOE) and educators in the field are required for meaningful reform to occur. However, the Massachusetts Department of Education has not provided the leadership required for districts to build the capacity necessary for education reform to become the reality articulated in the Education Reform Act of 1993. As a result, state policymakers have not advanced the goal of improving the mathematics performance of the one million students served by the Massachusetts public schools.

1. **Relevant Documents:** *educators need three documents in order to understand the mathematics standards – the Massachusetts Mathematics Curriculum Framework, the local mathematics curriculum, and the Guide to the MCAS: Mathematics.*
   - ✓ Most districts distributed the 1995 Massachusetts Mathematics Curriculum Framework.
   - ✓ Approximately three-quarters of all districts distributed a copy of the local mathematics curriculum to math teachers.
   - ✓ About one-third of the districts distributed the *Guide to the MCAS: Mathematics* (also known as the "Bridge Document").

2. **Curriculum Alignment:** *in order to teach to the standards of the Mathematics Curriculum Framework, local school districts must align their own curriculum with the standards.*
   - ✓ Slightly more than half of the districts have fully aligned their local mathematics curriculum to the 1995 Mathematics Curriculum Framework.

3. **District Professional Development Expenditures:** *the Legislature has mandated each year that districts spend a specific dollar amount per pupil on professional development for teachers, administrators, paraprofessionals and school council members.*
   - ✓ In FY98, 65% of all districts spent the required $75 on professional development activities.
   - ✓ In FY99, 54% of all districts spent the required $100 expenditure.
   - ✓ For FY00, only 28% of all districts budgeted $125 for professional development.

4. **District Professional Development Plans:** *the Education Reform Act mandates that each of the 329 school districts adopts an annual professional development plan.*
   - ✓ 217 districts have at least one professional development plan on file with the MDOE.
   - ✓ 18 districts submitted more than one annual plan.
   - ✓ Two districts submitted three annual plans.
   - ✓ Three of the 239 "plans" had district goals, professional development activities, and a budget.

5. **District Professional Development:** *in order for teachers to learn how to develop standards-based curriculum and use standards-based instructional strategies, districts must provide specific professional development to all mathematics teachers.*
   - ✓ Fewer than half of all districts have provided teachers with training in using curriculum frameworks to inform instruction.
   - ✓ Approximately two-fifths of all districts have provided teachers with training in the teaching methods and learning strategies related to standards-based curriculum, instruction and assessment.
   - ✓ Fewer than half of all districts have provided teachers with training in the components of the MCAS Mathematics test.
   - ✓ Fewer than half of all districts have provided teachers with training in interpreting MCAS Mathematics results and using results to inform instruction.
   - ✓ About one-third of all districts have provided teachers with training in creating remedial mathematics plans for students who "fail" the MCAS Mathematics test.

6. **Teaching Materials and Resources:** *teachers and students must have standards-based instructional materials aligned with the frameworks and local curriculum.*
   - ✓ Only 15% of middle schools and 10% of high schools had adopted standards-based mathematics textbooks prior to the first administration of the MCAS in spring 1998.
   - ✓ About one-third of middle schools and 40% of high schools have adopted standards-based mathematics textbooks in just the past two years.
   - ✓ Half of the middle and high schools have not adopted standards-based mathematics textbooks.

7. **Graduation Requirements:** *the 10th grade MCAS Mathematics test measures a student's knowledge of Algebra I and Geometry.*
   - ✓ Just over half of the districts require that students pass Algebra I and Geometry in order to earn a diploma.

8. **Leadership and Building Capacity:** *in order for 329 school districts to adopt the same standards and implement them so that the one million students served by over 1800 public schools have an equal opportunity to master the required information to pass the MCAS Mathematics test, the Massachusetts Department of Education must provide leadership in building district capacity for this massive undertaking to be successful.*
   - ✓ The MDOE relies primarily on Commissioner's Mailings to Superintendents and Charter School Leaders as the means of informing teachers and administrators about essential education reform information.
   - ✓ The MDOE has not provided teachers with documents necessary to implement the Mathematics Curriculum Framework, but is relying on teachers' noticing and, then, downloading such documents from the MDOE web page. Heavy reliance on this means of dissemination does not represent an adequate effort to make sure teachers have the documents they need.
   - ✓ The MDOE has not offered an adequate program of professional development that guides districts through the complexities of implementing the various requirements of the Education Reform Act of 1993.
   - ✓ The MDOE has not offered an adequate program of systemic, deliberate and statewide professional development for mathematics teachers that is focused on implementing standards-based curriculum, instruction and assessment and on implementing the Mathematics Curriculum Framework.
   - ✓ The MDOE has not offered an adequate program that focuses directly on improving mathematics achievement at the 8th and 10th grade levels.

Conclusions

1. The Board of Education has not provided the direction needed to implement the required elements of Education Reform with regard to the 1995 Mathematics Curriculum Framework.
2. The Board has focused almost exclusively on assessment and accountability without assuring the implementation of the learning standards in schools and districts across the Commonwealth.
3. The MDOE has not provided the leadership, information, training, and resources to schools and districts to successfully implement the requirements of the Education Reform Act of 1993 with regard to the 1995 Mathematics Curriculum Framework.
4. The MDOE has not monitored the implementation of the Mathematics Curriculum Framework at the district level.
5. The MDOE has not determined, through dialogue and work with teachers, the reasons for the poor student performance on the MCAS Mathematics test.
6. The Mathematics Curriculum Framework has not been deliberately and systemically implemented in all grades in all school districts in the Commonwealth.
7. A large percentage of districts have not aligned their mathematics curriculum to the framework.
8. A large percentage of districts have not adopted textbooks and materials that are standards-based and reflect the learning standards in the framework.
9. A large percentage of districts have not provided teachers with the adequate resources and the training necessary to teach students the material on which they will be tested.

Recommendations

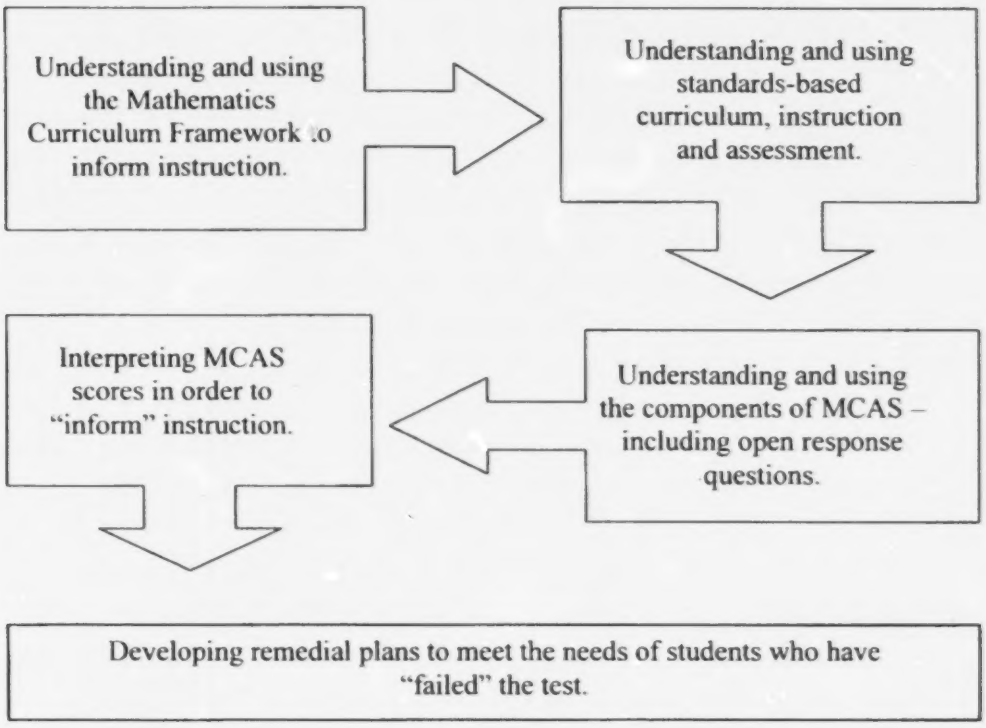
The Massachusetts Department of Education must

- Reestablish a relationship with the field built on trust and mutual respect.
- Broaden its "reach" beyond superintendents and school leaders.
- Hire as staff members educators who are well-versed in the workings of schools and school districts and well-respected by the field.
- Assign each school district in the Commonwealth a Department of Education staff member to act as coach, troubleshooter, and liaison.
- Reestablish regional offices that can serve as professional development centers.
- Adopt stable curriculum framework documents that are "user friendly," relate the learning standards to multiple measures of assessment, and have been approved by the appropriate professional content area association.
- Provide a reasonable timetable for implementation of the curriculum, instruction and assessment practices necessary for implementation; benchmarks should be attached to the timetable at the K-4, 5-8, and 9-12 levels.
- Create a process by which textbooks can be assessed and information can be disseminated to teachers and department heads.
- Create a calendar of regional meetings for school staff to learn about various aspects of curriculum implementation. These meetings should be held from 4:00 to 7:00 so that all school personnel are able to attend. These meetings should be held in small groups (no more than 50-60 participants) in different geographic areas of the state, including the Berkshires and the Cape and Islands.
- No assessment instrument should not be used as a "high stakes" accountability measure until such time as an outside evaluator has determined that districts have in fact aligned their curriculum and provided teachers with the resources necessary to instruct all students in the content of the learning standards on which they will be tested.
- Create a district professional development plan template for all districts: a uniform format for articulating goals, activities, and budgets. Mandatory training in the use of the template for all 329 districts should accompany its release.
- Return to the PALMS model of teacher-leaders in mathematics at the district level as a means of building capacity; mandate that all districts participate.

Local school districts must

- Provide all teachers with the information and resources necessary to successfully implement the curriculum frameworks.
- Align local curricula to the curriculum frameworks.
- Adopt textbooks that support the strands and standards in the Mathematics Curriculum Framework that are compatible with locally aligned curricula.
- Provide teachers with high-quality professional development to improve student achievement in mathematics.
- Adopt graduation requirements that mandate that all students take and pass the mathematics courses necessary for them to pass the Grade 10 MCAS Mathematics test.

- Provide teachers with high-quality, systemic professional development that is organized so that teachers move sequentially from understanding the frameworks and standards-based education to understanding and interpreting MCAS and the needs of students as illustrated below:


Understanding and using the Mathematics Curriculum Framework to inform instruction.
Understanding and using standards-based curriculum, instruction and assessment.
Understanding and using the components of MCAS – including open response questions.
Interpreting MCAS scores in order to "inform" instruction.
Developing remedial plans to meet the needs of students who have "failed" the test.

Educational Management Accountability Board, or its successor, must .

- Continue its fiscal oversight of local school districts through its audits.
- Determine if the Department of Education is implementing all aspects of the Education Reform Act of 1993 in a fair and equitable manner.

The local teachers' organization must work with district leaders to ensure

- That there is teacher participation in the development of district goals and district professional development plans.
- That each school develops an improvement plan that is based on participatory decision making and includes improving student achievement as a goal.
- That educators develop individual professional development plans and that districts provide them with "no cost" options as the law requires.
- That teachers participate in the development of aligned curricula.
- That teachers participate in the selection of new textbooks and teaching materials.
- That teachers participate in the articulation of school and district goals.

The statewide teacher organizations must work with policy makers and local affiliates to ensure

- That policies are developed and adopted that allow teachers and principals to provide students with the educational experiences and resources necessary to ensure that they pass the state assessments.
- That the expertise of educators in the field becomes an integral component of all education reform policy.

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A Massachusetts Teachers Association Research Study

Background

Students in the 8th and 10th grades have scored poorly on the 1998 and 1999 administrations of the MCAS Mathematics test. Given that students in the Class of 2003 must pass both the English Language Arts and the Mathematics tests in order to receive a diploma, it is essential that educators and policy makers understand the reasons for poor performance on the Mathematics test in order to develop solutions.

Although Massachusetts students perform relatively well in mathematics compared to students in other states as measured by the National Assessment of Educational Progress (NAEP), the Scholastic Aptitude Test (SAT) and other standardized tests, they clearly do not come close to meeting the standards assessed by the MCAS Mathematics test, particularly in Grade 10, where 53% of the test-takers failed the 1999 exam.

There are many factors that could contribute to the low test scores. Possibilities that have been suggested include:

- Problems with the test itself;
- Inadequacies with the Mathematics Curriculum Framework;
- Poor student motivation since the test results didn't "count";
- Improper criteria used for establishing the cut-scores;
- Teachers not teaching the content assessed by the test; and
- Inadequate or delayed implementation at the local level.

It has become evident that success on the MCAS requires alignment between the Massachusetts Curriculum Frameworks and the local curriculum. This study focuses specifically on the last issue – mathematics framework implementation at the local level and the specific assistance that the Massachusetts Department of Education has, and in some cases has not, provided to districts and teachers. Other research should be done to determine what other factors, if any, are contributing to the high failure rate.

Chronology of State Actions related to Mathematics Curriculum Framework and MCAS Administration

1995

December 12	Board of Education endorses and accepts the Mathematics Curriculum Framework. This is the document that districts are to use in aligning the local mathematics curriculum.

1996

February 1	Superintendents receive a copy of Mathematics Framework and are asked to copy and to circulate it widely.

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	June 18	Board of Education votes to pilot test mathematics questions in Spring 1997.
1997		
	April-May	MCAS administration of tryout questions in mathematics occurs. No results are reported to individuals, schools or districts.
1998		
	February 12	Superintendents receive copies of the *Guide to the MCAS: Mathematics* (also known as the "Bridge Document").
	May 11-22	MCAS administration in Grades 4, 8, and 10 occurs.
	October 1	Board of Education votes to put the Revised Mathematics Curriculum Framework out for public comment.
	November 24	Board of Education votes to set the competency determination: MCAS grade 10 passing score of 220 in English Language Arts and mathematics as a graduation requirement for Class of 2003.
	December 9	School and District 1998 MCAS results are released.
1999		
	May 17-June 1	MCAS Administration in Grades 4, 8, and 10 occurs.
	September 28	Board releases Revised Mathematics Curriculum Framework for public comment.
	November 10	State 1999 MCAS results are released.
	December 7	District 1999 MCAS results are released.
2000		
	February 24	Board of Education "conditionally endorses" the Revised Mathematics Curriculum Framework.
	March 27	Board of Education receives a progress report on the revision of the Mathematics Curriculum Framework.
	May 15-26	MCAS administration in Grades 4, 8, and 10 occurs.
	May 23	Board of Education receives a further progress report on the revisions of the Mathematics Curriculum Framework.
	July 25	Board of Education approves the Revised Mathematics Curriculum Framework.

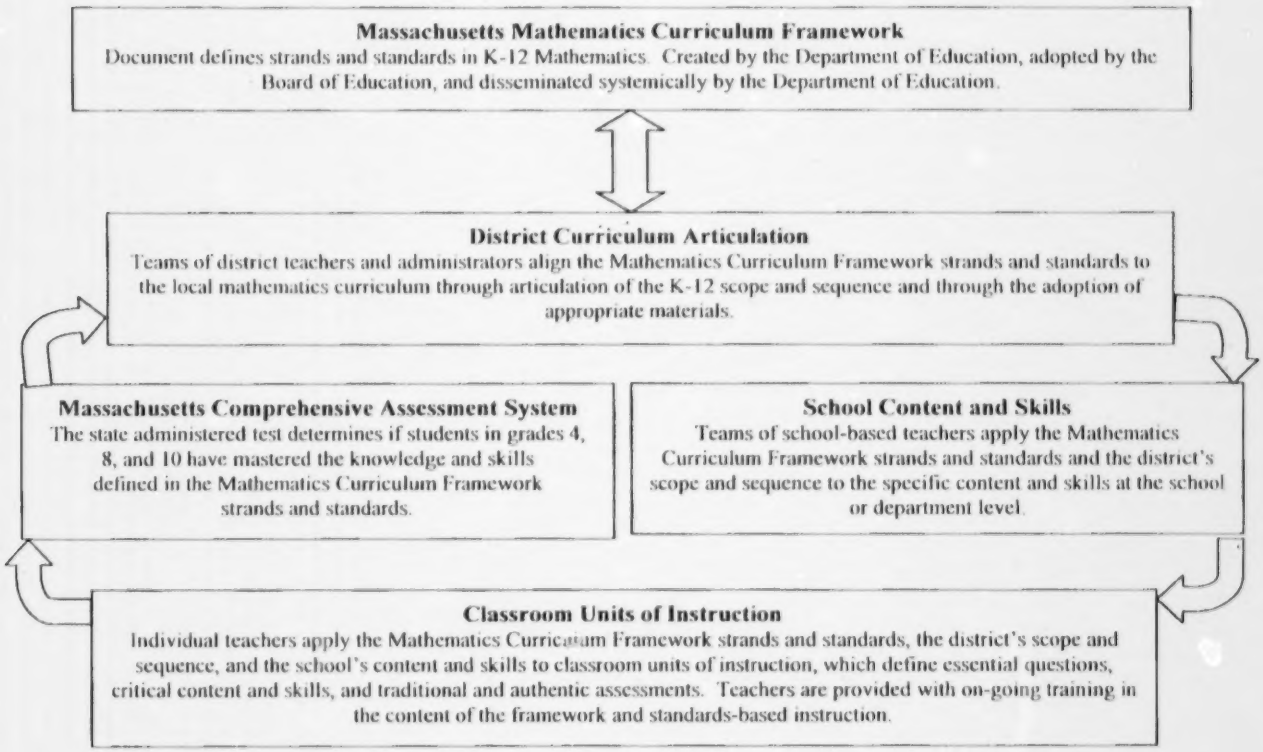
Assumptions about Curriculum Implementation

The Education Reform Act of 1993 calls for local curriculum alignment with state standards that are defined by the Massachusetts Curriculum Frameworks. This requires a deliberate, systemic and statewide model to be developed and applied across all 329 school districts in the Commonwealth. For this to happen, the state agency charged with overseeing the implementation, the Massachusetts Department of Education (MDOE), must provide daily leadership to schools and districts in order to build the internal capacity needed to implement such a massive undertaking.

The MDOE is charged with the implementation of education reform. It is, therefore, reasonable to assume that such a model be developed by the MDOE and disseminated in a systemic way to all school districts. In the usual MDOE parlance, such an effort would be called "technical assistance." It is imperative that such technical assistance actually be received by teachers in all districts if all students are to be provided with the learning opportunities necessary for them to demonstrate what they know and can do on the Massachusetts Comprehensive Assessment System test.

With respect to mathematics, effective implementation also requires that there be an analysis at the local level of what is currently being taught from Grades K through 12. Based on such an analysis, teachers

then determine the topics that should be deleted, added, or redistributed across the K-12 scope and sequence relative to what the curriculum frameworks assume test-takers have been taught. The specific goal of such curriculum realignment with the Mathematics Curriculum Framework is to ensure that all students are provided with learning opportunities necessary for them to demonstrate what they know and can do on the Massachusetts Comprehensive Assessment System Mathematics test. In investigating the implementation of the Mathematics Curriculum Framework, it is logical and reasonable to assume that certain steps would be taken that require on-going communication and dialogue, as follows:


Massachusetts Mathematics Curriculum Framework
Document defines strands and standards in K-12 Mathematics. Created by the Department of Education, adopted by the Board of Education, and disseminated systemically by the Department of Education.
District Curriculum Articulation
Teams of district teachers and administrators align the Mathematics Curriculum Framework strands and standards to the local mathematics curriculum through articulation of the K-12 scope and sequence and through the adoption of appropriate materials.
Massachusetts Comprehensive Assessment System
The state administered test determines if students in grades 4, 8, and 10 have mastered the knowledge and skills defined in the Mathematics Curriculum Framework strands and standards.
School Content and Skills
Teams of school-based teachers apply the Mathematics Curriculum Framework strands and standards and the district's scope and sequence to the specific content and skills at the school or department level.
Classroom Units of Instruction
Individual teachers apply the Mathematics Curriculum Framework strands and standards, the district's scope and sequence, and the school's content and skills to classroom units of instruction, which define essential questions, critical content and skills, and traditional and authentic assessments. Teachers are provided with on-going training in the content of the framework and standards-based instruction.

Embarking on a reform that conservatively involves one million students and 90,000 teachers and administrators in over 1800 schools in 329 districts, and whose realization is measured by the administration of a statewide test, requires that the MDOE develop and implement a comprehensive plan that brings all of the foregoing stakeholders to the same stage of implementation on approximately the same schedule: this means leadership from the state agency.

This leadership must focus on the two areas identified by McLaughlin and Yee (1988) as essential in shaping careers in education: *level of opportunity* and *level of capacity*. "*Level of opportunity* means the chance to develop basic competence; the availability of stimulation, challenge, and feedback about performance; and the support for efforts to try new things and acquire new skills." MDOE should be providing leadership to broaden opportunity to all educators through a deliberate and systemic approach that provides them with the professional development necessary to introduce standards-based curriculum, instruction, and assessment practices into their pedagogical repertoires. Studies have demonstrated that teachers value meaningful district-based professional development that is long-term and tied directly to

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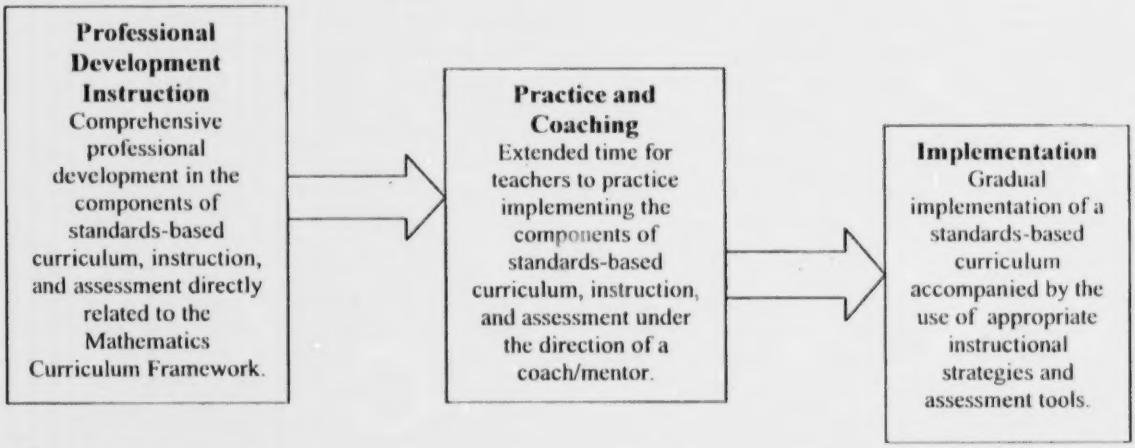
school change. McLaughlin and Yee found that "opportunities to improve performance, particularly in the context of collegial interaction, are also valued rewards in themselves."

McLaughlin and Yee (1988) state that "*Capacity* comprises teachers' access to resources and the ability to mobilize them, the availability of the tools to do their job, and the capability to influence the goals and direction of their institution." The MDOE should be developing and implementing a systemic plan that builds capacity throughout the 329 districts. As McLaughlin and Yee argue,

> Teachers teaching in classrooms is what education is all about. The ability of the institution to change and to adapt turns on the ability and willingness of teachers to change and adapt. Individual competence and motivation are thus among the most important assets of a school … In education, where teachers comprise the technology, the link between individual responses to challenge and change and organizational effectiveness is direct and irreducible. … Accountability rooted in the professional orientation of teachers provides a form of control much more secure when classroom doors are closed than that vested in formal roles, sanctions, or authority.

The MDOE should provide leadership through technical assistance to schools and districts and provide a clearinghouse of "experts" to work with mathematics teachers, especially at the middle and high school levels. Such a model for building capacity would involve


Professional Development Instruction
Comprehensive professional development in the components of standards-based curriculum, instruction, and assessment directly related to the Mathematics Curriculum Framework.
Practice and Coaching
Extended time for teachers to practice implementing the components of standards-based curriculum, instruction, and assessment under the direction of a coach/mentor.
Implementation
Gradual implementation of a standards-based curriculum accompanied by the use of appropriate instructional strategies and assessment tools.

Research Questions

This study asks the questions: Are schools and districts providing students with the curriculum and instruction necessary to succeed on the MCAS Mathematics test? If so, how far have they gone? If not, why not?

A variety of data sources (Appendix A) were used to answer these questions. In order to determine the implementation steps taken by school districts, the following questions were also asked:

- Are schools and districts providing students with the curriculum and instruction necessary to demonstrate achievement on the MCAS Mathematics test?
- To what extent has the 1995 Mathematics Curriculum Framework been implemented at the local level?

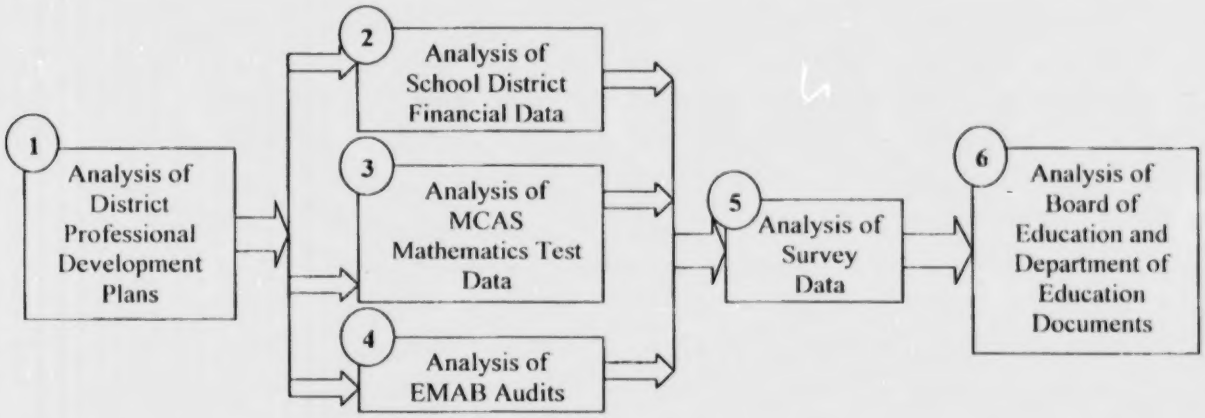
- To what extent has the MDOE provided technical assistance to the field?

To answer these questions, researchers focused on

1. Decisions made by the Board of Education related to
   - Curriculum frameworks;
   - Student assessment;
   - School and district accountability; and
   - Professional development (Appendix B).
2. Communication between the Department of Education and teachers and administrators specifically related to
   - Curriculum frameworks;
   - Student assessment;
   - School and district accountability;
   - Professional development; and
   - Informing the field (Appendix B).
3. Professional development offerings by the Massachusetts Department of Education and the MDOE mathematics initiative: Partnerships Advancing the Learning of Mathematics, Science, and Technology (PALMS) Program related to
   - Education reform (Appendix C);
   - Mathematics/science training (Appendix D); and
   - Mathematics training (Appendix D).
4. District professional development planning as defined by
   - District professional development plans on file with the Massachusetts Department of Education (Appendices F and H); and
   - Reported expenditures by districts on professional development line item 2350 (Appendices G and H).
5. Local implementation surveys completed by teachers' association leadership teams (Appendix E) that focused on five key areas:
   - Access to curriculum articulation documents defining the standards upon which the MCAS Mathematics test is based;
   - Alignment of local mathematics curriculum with the Massachusetts Mathematics Curriculum Framework;
   - Access to and participation in district-based professional development providing educators the knowledge and skills necessary to implement the Mathematics Curriculum Framework in classrooms;
   - Adoption of standards-based textbooks and instructional materials; and
   - Graduation requirements aligned to Mathematics Curriculum Framework.
6. MCAS Mathematics test data, including both statewide and local average scaled scores.
7. District audits conducted by the Education Management Accountability Board.

Methodology

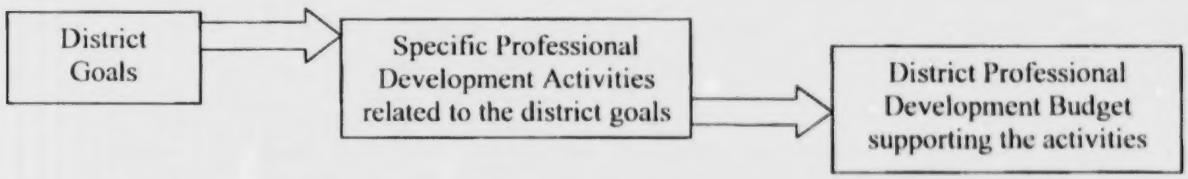
This study focused on six types of analyses from December 1999 through September 2000.



1. Analysis of District Professional Development Plans

Initially in December 1999, and again in September 2000, the Massachusetts Teachers Association's Center for Educational Quality and Professional Development (CEQ) staff using an assessment rubric (Appendix F) examined the district professional development plans on file at the Massachusetts Department of Education. The Education Reform Act of 1993 mandates that all districts create an annual professional development plan. There were 239 documents entitled "Professional Development Plans" available for examination. According to Department of Education staff, they represented all plans in the MDOE's possession from 1995 through June 2000.

The assessment rubric used to rate these district professional development plans focused on three essential elements:


District Goals
Specific Professional Development Activities related to the district goals
District Professional Development Budget supporting the activities

2. Analysis of School District Financial Data

In January and February 2000, CEQ researchers - with the assistance of the financial expertise of the MTA's Division of Research – analyzed the MDOE data directly related to actual district expenditures, i.e. the specific amount of money appropriated by the Legislature in each school district for professional development for FY98 and FY99 and the projected expenditures for FY00. In FY98 districts were required to spend $75 per pupil on professional development; in FY99, $100; and in FY00, $125. These

funds are to be expended on distinct items directly related to the professional development of teachers, administrators, paraprofessionals and school council members (Appendix G).

3. Analysis of MCAS Mathematics Test Data

During this same time period, CEQ researchers analyzed the 1999 MCAS data from the MDOE and began to formulate a series of questions for teacher association leaders. These questions were designed to obtain data on the actual implementation of the Mathematics Curriculum Framework in a random sample of school districts.

4. Analysis of EMAB Reports

In March and April 2000, CEQ researchers analyzed the findings of the Summative Reports of the Educational Management Accountability Board (EMAB). To date, nineteen school districts have been audited by the EMAB; eighteen audits were available for review.

5. Analysis of Survey Data

From May 5-15, 2000, CEQ researchers disseminated and collected a descriptive survey (Appendix E) of local association leaders in 65 school districts. The survey focused on specific elements of curriculum implementation to determine whether districts had provided teachers with the resources – materials, training, and information – necessary to prepare students to succeed on the MCAS Mathematics test. These results were compiled and analyzed by CEQ staff.

6. Analysis of Board of Education and Department of Education Documents

In May-July 2000, CEQ researchers analyzed every *Board in Brief* and *Commissioner's Mailing* from 1995 through July 2000 available on the Department of Education web site for content specifically related to five key areas:

- Curriculum Frameworks;
- Assessment;
- School and District Accountability;
- Professional Development; and
- Informing Teachers and Administrators in the Field.

Sample Survey

Survey data were collected and analyzed from 56 public school districts operating in 66 communities (Appendix H) representing one-fifth of the Commonwealth's public school students. A total of 65 local associations out of 283 teachers associations returned surveys: a 23% return rate. Nine of the 65 surveys were discarded for providing incomplete information. Thus, the surveys analyzed represent 20% of the teachers associations affiliated with the Massachusetts Teachers Association.

The teachers' association in each of the sample survey districts is affiliated with the Massachusetts Teachers Association and the National Education Association (MTA/NEA). Local association presidents and their executive boards are familiar with the curriculum issues, textbook adoptions, and professional development programs in their districts. As teacher representatives, they may participate in decision-making related to these professional areas. As educators, they may be members of curriculum development and textbook selection teams. They have all participated in district professional development programs.

The sample survey districts are located across the Commonwealth of Massachusetts from Cape Cod to Cape Ann, from metropolitan Boston to the Berkshires. The districts are urban, suburban, and rural and include high and low income communities. The sample survey includes the districts among those with the highest and the lowest 1999 MCAS Mathematics test scores in Grades 8 and 10.

On the 1999 MCAS, slightly over half of all Grade 10 students statewide failed the Mathematics test; slightly under half of the Grade 10 students in the sample survey districts failed this test. Two-fifths of the Grade 8 students failed Mathematics statewide as did those in the sample districts (Table 1).

	Number of schools	Statewide Failure Rate	Sample District Failure Rate	Lowest Failure Rate		Highest Failure Rate	
				Statewide	Sample	Statewide	Sample
Grade 8	70	40%	41%	6%	7%	77%	77%
Grade 10	53	53%	48%	12%	17%	89%	78%

Table 1: Statewide and sample survey district failure rates on the 1999 administration of the Grade 8 and Grade 10 MCAS Mathematics test.

These findings strongly support the conclusion that, with respect to failing the MCAS Mathematics test, the student population in the sample survey districts is representative of the student population in the state as a whole.

Scope and Limitations of this Study

This study uses government documentation and survey data as the basis for analysis of the implementation of education reform specifically related to the Mathematics Curriculum Framework. The results cannot be applied to the implementation of any other curriculum framework.

This study focuses on 56 randomly selected school districts that are representative of the 329 school districts in the Commonwealth in terms of student performance on the MCAS Mathematics test. As will be demonstrated in the study itself, these districts are also representative with regard to expenditures on professional development and new textbook adoptions. It can be assumed that the results are statistically representative of districts across the state.

The Boston Public Schools are not included in this study. Boston is a flagship school system that is best compared with other "Great City" school systems. Therefore, the results of this study cannot be applied to the public schools in Boston.

This study is not an endorsement of the content and/or teaching methods recommended or resulting from the implementation of 1995 Mathematics Curriculum Framework.

While teacher leaders report that their district may have aligned its curriculum to the Mathematics Curriculum Framework, this is not necessarily an indicator of the degree to which individual teachers have aligned their classroom practice to the local curriculum. That is the subject for another study.

Introduction

The Massachusetts Education Reform Act was signed into law on June 18, 1993. However, the current education reform movement dates to the publication of *A Nation at Risk* in 1983, which spoke of a "rising tide of mediocrity" in the nation's schools. That report prompted the National Governors Association to focus attention on improving the nation's schools: both the infrastructure and the content of instruction. With this political attention came the "standards movement." The US Department of Education Goals 2000 program is an outgrowth of this movement.

Specifically related to mathematics – the focus of this study – the National Council of Teachers of Mathematics (NCTM), the primary content organization for K-12 mathematics teachers, created the *Curriculum and Evaluation Standards for School Mathematics* in 1989. This document defined the learning outcomes in broad areas at the elementary, middle, and high school grade levels. In October 1991, the NCTM began to discuss forming a partnership with the New Standards Project. During the same year NCTM published *Professional Standards for Teaching Mathematics*. *Assessment Standards for School Mathematics* was published by NCTM in 1995.

The Board of Education approved the Mathematics Curriculum Framework in December 1995. This action created a fundamental shift in the curriculum, instruction, and assessment of mathematics.

Curriculum: One of the aims of the standards movement is to "standardize" what all students learn, not just those in "successful" school districts. Until the advent of the standards movement, there was a general lack of uniformity in curriculum among schools locally or nationally. Districts may have had *curriculum guides* - detailed documents defining units of instruction in a content area - available to teachers; content areas may have had a *scope and sequence* – a listing of the topics taught within a content area and the grade by which they are to be covered. However, in reality, individual teachers determined if and when specific topics would be taught and for how long. Such a system produces uneven results. As a reaction to this system, the standards movement resulted in 49 states adopting learning standards in the major content areas. Educators and policymakers began to focus on "outcomes": what do students know and what are they able to do.

Instruction: For teachers, the standards movement changed the manner in which curriculum is selected, prepared, and presented. Instruction – which had been *teacher-centered*, often characterized as "chalk and talk" – now became *student-centered* where the burden is on the student to demonstrate mastery of standardized learning outcomes through daily classroom work. New teaching methods are needed for this new curriculum. Teachers must add to their *instructional repertoire* such practices as cooperative learning, Socratic seminars, inquiry-based learning, and group investigation.

Assessment: A second aim of the standards movement is to measure the educational progress of all students through the same assessment tool that is directly correlated to the state's learning standards. Assessment is no longer the Friday test of the week's instruction. An array of *assessment tools* has been introduced to the lexicon and practice of teachers: performance assessment, authentic assessment, portfolio development, and exhibitions.

In summary: **The Massachusetts Board of Education, by developing and adopting the standards-based Mathematics Curriculum Framework forced fundamental changes in the curriculum, instruction, and assessment practices of mathematics teachers.**

Mathematics Curriculum Framework Documents

In order for teachers to effectively implement the requirements of the state and national standards found in the Mathematics Curriculum Framework, they must be provided with personal copies of two government documents:

- the 1995 *Massachusetts Mathematics Curriculum Framework: Achieving Mathematical Power* and
- the 1998 *Guide to the MCAS: Mathematics* (also known as "the "Bridge Document").

The district must provide teachers with the local mathematics curriculum, including a K-12 scope and sequence, and the textbooks and materials necessary to teach the curriculum to students.

Those teachers who are familiar with the "Bridge Document" report that it is the most important of the three since it demonstrates how the standards and strands in the framework are turned into assessment questions that appear on the MCAS Mathematics test. However, a substantial number of teachers did not know that such a document existed.

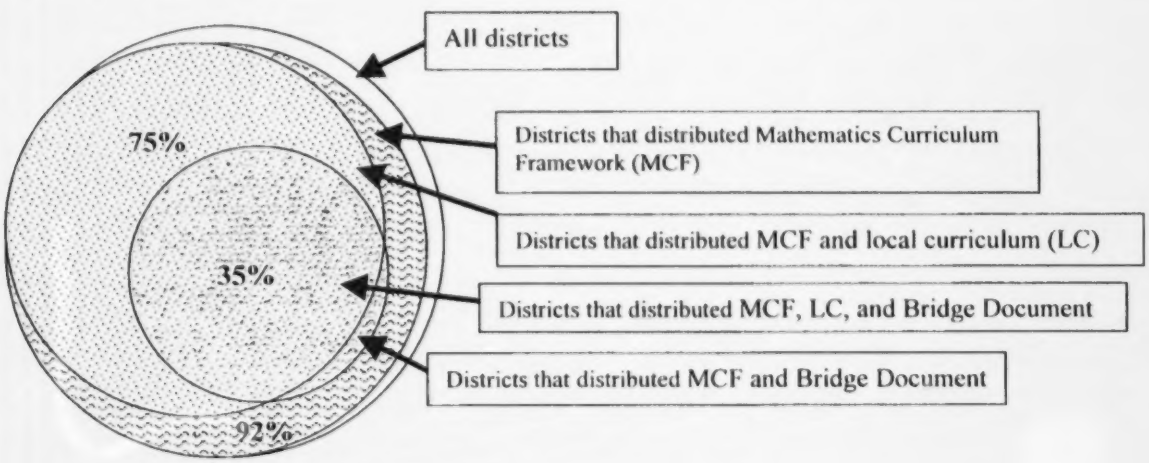

All districts
75%
Districts that distributed Mathematics Curriculum Framework (MCF)
Districts that distributed MCF and local curriculum (LC)
35%
Districts that distributed MCF, LC, and Bridge Document
Districts that distributed MCF and Bridge Document
92%

Figure 1: Alignment of sample districts that distributed three essential documents to teachers.

In the sample survey districts, teacher-leaders reported that (Figure 1):

- ✓ 92% of districts provided a copy of the Mathematics Curriculum Framework;
- ✓ 75% of districts provided a copy of the local mathematics curriculum; and
- ✓ 35% of districts provided a copy of the Mathematics Bridge Document.

While there appears to have been near universal distribution of the Mathematics Curriculum Framework, the more valuable document was disseminated in only one-third of the districts. When it came to putting the more useable document into the hands of teachers, the MDOE fell short. A question for further study would be the effectiveness of the manner in which MDOE disseminated these documents to the field. Currently the practice is that the MDOE sends a copy (or copies) to the superintendent who is then charged

with copying and distributing the documents to the appropriate staff members. Examples of this mode ofinforming the field are found in the *Commissioner's Mailings* after the Board approved the Mathematics Curriculum Framework on December 12, 1995 (Appendix A):

- ✓ On December 18,1995, Commissioner Antonucci wrote to superintendents indicating that the frameworks were posted on the MDOE web page and should be accessed in that manner because "hard copies have not been printed and will not be available in the near future."
- ✓ On February 1, 1996, Commissioner Antonucci wrote to superintendents indicating that he was providing a set of the five endorsed content area frameworks and the common chapters. Superintendents were told to "copy these documents and circulate them widely as you begin to develop your local curriculum."

The MDOE from the outset of the implementation phase left to school districts the critical responsibility of disseminating the MDOE documents which teachers needed to understand and implement education reform. It would appear that the MDOE relied on the power of suggestion to assure that superintendents did copy and disseminate as they were directed.

- ✓ On January 7, 1998, Commissioner Antonucci wrote to superintendents "I want to also recommend that you check to be sure that all your teaching staff have the copies of the state frameworks which they need. I have heard some reports that not all teachers have the frameworks and this is crucial."

The MDOE staff administers through a National Science Foundation grant the Massachusetts Statewide Systemic Initiative, PALMS (Partnerships Advancing the Learning of Mathematics, Science and Technology).[2] This program seeks to advance the "site specific theory of reform." The PALMS (1999) Program Effectiveness Report states that "although Massachusetts remains a local control state, where curriculum decisions are made at the district level, the new assessment system essentially means that all districts are now responsible for providing a curriculum based on state and national standards." It is clear that MDOE staff understood the breadth of the reform required by the Education Reform Act. However, there is a gap between its rhetoric and its actions.

The question of who is responsible for informing teachers of the content of such documents and how to use them effectively is unclear. However, it goes to the issue of leadership and building capacity. Rather than providing the former to increase the latter, the MDOE has chosen to discharge its responsibility for informing teachers of the content of these documents by merely telling superintendents they should make copies for distribution.

In summary: **The necessity of having a systemic plan that provides all school staff with the basic resources to implement the Mathematics Curriculum Framework for all students is fundamental to the central thrust of the Education Reform Act of 1993. Unfortunately, the MDOE did not assure the dissemination of necessary documents to all mathematics teachers as part of a strategic plan. Nor did the MDOE take steps to assure that local school districts would carry out this vital task. Nor has the MDOE provided the leadership to assist districts in building capacity to begin the implementation of the Mathematics Curriculum Framework at the local level.**

Mathematics Curriculum Alignment

In order for districts to successfully implement the requirements of education reform, staff must align the local curriculum with the Mathematics Curriculum Framework. Alignment requires time and expertise. Time for teachers to work together is a problem in all school districts. Expertise to guide systemic curriculum reform is an even rarer commodity; only recently have districts begun to seek the expertise of curriculum directors and to hire such professionals.

It is clear from reading certain MDOE documents that at the beginning of the education reform process, there was someone at the MDOE who understood the depth and breadth of involvement required for the standards to be implemented at the local level. For example, the PALMS Phase II Effectiveness Report (1999) provides a "vision for full implementation" of "new forms of science and mathematics learning..." in which "... the district aligns its K-12 curriculum with state frameworks through revision of curriculum guides and specific plans to support implementation of standards-based curriculum." In further describing this vision of education reform, the report also states that, "the school works to align its curriculum to the state curriculum frameworks and learning standards. The principal supports reform by providing ongoing professional development opportunities, resources, and supervision consonant with the pedagogy of inquiry." Further the report states that "Mathematics, science, and technology are taught for a substantial amount of time at every grade level. Content, pedagogy, and classroom assessment are aligned with the curriculum frameworks. Teachers pilot and implement standards-based curriculum materials as they become available." However, this vision for implementation was not acted upon by the MDOE.

Curriculum alignment requires time on the part of both teachers and administrators familiar with the K-12 scope and sequence and the textbooks and materials used by the district. The local mathematics curriculum must be aligned to the Mathematics Curriculum Framework at every grade level to assure that all students are provided with the curriculum and instruction to prepare them for MCAS.

In the sample survey districts, teacher-leaders reported that:

- ✓ 17% of the districts have had no alignment with the Mathematics Curriculum Framework.
- ✓ 29% of the districts have partial alignment.
- ✓ 54% of the districts have aligned the entire K-12 mathematics curriculum with the Mathematics Curriculum Framework.
- ✓ 62% - 70% of districts have alignment at a single grade level (K-12).

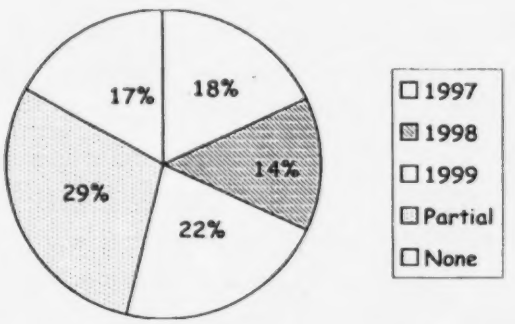


Figure 2: Percentage of districts that have aligned local curricula with Mathematics Curriculum Framework.

Of the 54 % of the districts with total K-12 mathematics alignment (Figure 2):

- ✓ 22% completed the alignment by June 1997 – one year prior to the first MCAS administration;
- ✓ 14% completed the alignment by June 1998 – after the first MCAS administration; and

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- ✓ 18% completed the alignment by June 1999 – after the second MCAS administration.

In terms of when the curriculum alignment occurred in the sample survey districts, teacher-leaders reported that:

- ✓ Only 22% of districts have been aligned with the Mathematics Curriculum Framework for one school year prior to the first MCAS administration in Spring 1998.
- ✓ Thus, 49% of the districts reviewed did not begin to align their local curriculum to the Mathematics Curriculum Framework until after the first administration of the MCAS in 1998; and
- ✓ 17% have done nothing.

The MDOE PALMS Phase II Effectiveness Report (1999) is consistent with the findings of this study: 55% of the PALMS districts had modified their curriculum to match state standards and 43% of all districts statewide had modified their curriculum.

Andrew C. Porter and John Smithson (2000) at the Wisconsin Center for Education Research report in a soon-to-be published study of testing and curriculum alignment in ten states, of which Massachusetts is one, found that curriculum is not aligned with state standards. "The highest level of overlap between teaching and the test was 46 percent – in 4th grade science in a single state. The lowest level, 5 percent, between a state test and instruction was in 8th grade math." Education Week (June 7, 2000) reports that "regardless of the reasons for the high degree of misalignment between teaching and testing the Wisconsin researchers found, some critics have attacked states for not doing enough to explain to teachers what is on the state tests – an omission seen as especially troubling given the penalties and rewards states increasingly have attached to their exams." This study confirms the Porter-Smithson critique of state implementation that applies to MDOE.

In summary: **Again, the MDOE has not offered adequate leadership to administrators and teachers through systemic, deliberate, statewide assistance focused on local curriculum alignment with the Mathematics Curriculum Framework. Rather, districts have been left on their own to align or not align their curriculum to the state standards. Most districts have either not modified their curriculum or have had an aligned curriculum in place for less than two years. While it might be argued that local education authorities have not met their obligation to implement education reform, it can also be argued that this failure is due to the absence of assistance, leadership, or capacity building from the MDOE. Further, should the recent revision of the Mathematics Curriculum Framework document actually be tied to MCAS questions, this will require all districts to review and align the curriculum to a new standard. The MDOE's implementation has fallen short in the most fundamental step – ensuring that what is being tested is, in fact, being taught.**

Textbooks and Materials

Once the local curriculum is aligned to the Mathematics Curriculum Framework, districts must determine if the textbooks and/or instructional materials currently being used are compatible with the curriculum. The Mathematics Curriculum Framework has essentially forced districts to adopt textbooks and materials that are standards-based and include an integrated approach to mathematics instead of the discrete texts used in the past, e.g. Algebra I text followed by a Geometry text. This is a question of the

adequacy of resources. McLaughlin and Yee (1988) argue that " a *resource-adequate* environment is one that provides the minimum tools and conditions necessary to teaching. ... Gross deficiencies...impede teachers' efforts to provide even an adequate level of instructional activity for their students and leave them feeling effectively powerless."

In the sample survey districts, teacher-leaders reported that half of the districts **have not** adopted middle school and high school textbooks and materials that are standards-based.

In those districts that did adopt new textbooks (Figure 3),

- ✓ 10% of the high school textbooks were adopted before 1998;
- ✓ 15.5% of the middle school adoptions occurred prior to 1998;
- ✓ 40% of the high schools adopted new textbooks after 1998; and
- ✓ 34.5% of the middle schools adopted new textbooks after 1998.

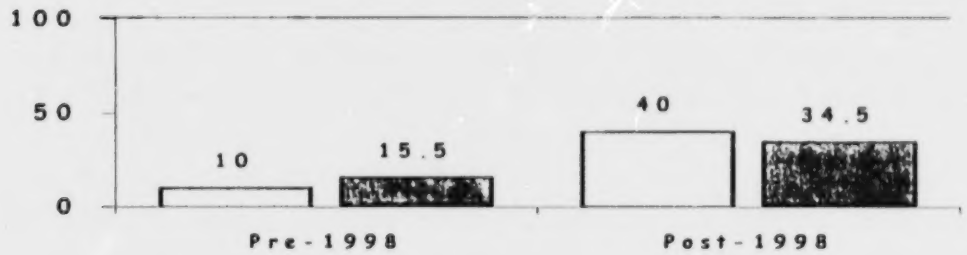

Figure 3: Percentage of middle ☐ and high schools ■ with new mathematics textbooks adoptions prior to 1998 and after 1998..

The MDOE's PALMS (1999) report is consistent with this study's findings: in 57% of the PALMS districts "a majority of teachers" of mathematics are using standards-based materials. It can be implied from this report that in 43% of the districts participating in the PALMS initiative, that either no mathematics teachers or fewer than 51% are using standards-based materials. Even in the districts where a "majority" of teachers are using standards-based materials, the final percentage of teachers could actually be a small insignificant number. In fact, it can be concluded that less than one-third of the teachers in the PALMS districts may actually be using standards-based textbooks and materials.

The EMAB audits are consistent with this finding as well: they found that while there had been a substantial reinvestment in textbooks and other educational supplies, in only seven of the 18 audited districts (39%) had the school system met the foundation budget target for this category.

In summary: **The vast majority of districts have not provided mathematics teachers with the textbooks and materials necessary to instruct students in a standards-based curriculum and to evaluate student work using standard-based assessment instruments. Therefore, teachers are not being provided with adequate resources to instruct their students in the curriculum assessed by the MCAS.**

Professional Development

The key to full and successful implementation of any new curriculum model is high quality professional development that provides teachers with the training and materials related to requisite knowledge and pedagogical skills. J.W. Little (1988) states that

> The work of schoolteaching is characteristically "professional" work; it is complex and subtle, requiring informed judgment by well-prepared practitioners in circumstances that are often ambiguous or difficult. Current arrangements often retard rather than advance teachers' professional capacities for sound judgement when they restrict opportunities for joint study and problem solving and when complex issues are tackled primarily through the exercise of bureaucratic rule-making.

The work of education reform requires that teachers exercise their best judgment after understanding the complexity of the standards movement and its place in the daily instruction of the schoolhouse.

Joyce and Showers (1988) argue that "professional knowledge consists of three overlapping components: the study of academic content, that which undergirds the content that is to be learned by the students; the study of curricular and instructional strategies, the process of organizing content and helping students study; and the process of school improvement, the cooperative work by faculties to make the school better."

The adoption of the Mathematics Curriculum Framework involves these three areas as well. First, teachers must understand the mathematical content of the standards. While the vast majority of middle and high school mathematics teachers have a solid foundation in mathematics, the framework reorganized the content in such a manner that teachers would need to refocus their attention on a different scope and sequence than that traditionally used – arithmetic to algebra to geometry to trigonometry to calculus – to an integrated approach. Second, teachers must learn the elements of standards-based instruction and its impact on curriculum, instruction, and assessment. Third, mathematics teachers must learn to work collaboratively across grades and schools; the traditional isolation of the classroom is an impediment to implementing the new learning standards.

There is a substantial body of pre-1993 research that relates the importance of staff development to curriculum implementation. Joyce and Showers (1988) in summarizing the findings of a number of researchers, state that

> Initiatives to improve curriculum areas or to establish new ones are especially important to the systemic and collective components of the staff development system. It has been well established that curriculum implementation is demanding of staff development – essentially, without strong staff development programs that are appropriately designed a very low level of implementation occurs.

However, much additional research has been conducted since the inception of the standards movement. Wheelock (in Haney, 2000) argues that "professional development should NOT be general. It should be tied explicitly to implementing a thinking skills curriculum – in subject areas, in information processing. It has to:

(a) account for teacher turnover (so it can't be a one-shot deal and has to be ongoing);
(b) to take place over several years, so that teachers can learn from mistakes, adapt curriculum in a way that makes it theirs, see the results in student learning (which changes expectations among both students and teachers);

(c) include in-school, in-class coaching, phone consultation, and demonstration lessons for new curriculum;
(d) be school-based, focused on getting teachers into productive professional relationships in each school, department, grade; and
(e) include special education and bilingual teachers – who are often left outside such efforts."

It would appear that the Legislature determined professional development would be a critical component of implementing education reform. The Education Reform Act of 1993 mandates that districts develop an annual professional development plan and that it be supported by a budget. Each year the Legislature has increased this mandatory commitment from $25 per student in 1994 to the current $125 per student in 2000 ($1,181,812 statewide).

In its *Goals 2000 Five Year Master Plan* (1995), the MDOE outlined a process for "schools, districts, and the state [to] work together to create the conditions in which student performance improves [and] support for public education will grow."

The *Master Plan* states that "the state wide professional development plan will focus on developing teachers' abilities to teach in this manner." The section of the Master Plan entitled "Statewide Professional Development for Teachers" indicates the importance of professional development:

> The success of Education Reform depends on substantial local, state, and federal resources devoted to high quality professional development linked to improving student learning. Public education is in the process of fundamental change. Teachers cannot depend solely on textbooks and lectures to fulfill their roles as instructional leaders. They are expected to design and use cooperative, project-based, interdisciplinary curriculum units that integrate technology, the community, the work place, the state's Curriculum Frameworks, and an authentic system of assessment. *Taken together, each component of this new vision for the classroom poses an enormous challenge to seasoned and novice teachers alike.* [emphasis added]

The MDOE recognized that the implementation of education reform would be an "enormous challenge" and that the role of teachers had to expand for the process of implementing education reform to succeed.

The *Master Plan* further indicates that

> In this context, professional development will mean more than just taking classes at a local teacher training institution. Teachers *need a supportive professional environment* at the school site which *nurtures new ideas, encourages innovation*, and places *a high priority on peer support.* Teachers must have the *time to investigate new approaches, the resources to access the state-of-the-art teaching practices*, and *the flexibility to regularly communicate and collaborate with fellow educators.* [emphasis added]

Each of the components stressed in the above paragraph is a fundamental requirement for the successful implementation of education reform at the school and district level. That the MDOE recognized these elements so early in the reform process indicates that, at least at the beginning of reform, state officials understood the complexity and the components of the process. Unfortunately, the MDOE never matched its rhetorical endorsement of this plan with the technical assistance to schools and districts needed to make it work in fact.

The *Master Plan* continues:

> *Each year* the Department will *develop a statewide plan for professional development* which will clearly identify *priorities, resources,* and a *detailed action plan* for linking state initiatives to district, building, and individual education professional development plans. Over the next four years, *the top priority of all teachers' professional development plans should be the implementation of the Curriculum Frameworks and assessment.* Most state professional development resources will be targeted towards that end. In addition to this primary focus, a statewide network of professional development providers will be approved by the state for educators and districts to contract with for additional professional development services. *Although the state will devote significant attention and resources to professional development, the responsibility to design and pursue professional development is local, shared by each educator and his or her school district.* [emphasis added]

In fact, the MDOE has not even developed an annual state professional development plan. To date there should have been seven such plans (1994-2000): in fact, the MDOE has created two such plans: the 1995 State Plan and the 1998 State Plan. In 1999, the MDOE identified three goals for professional development; they were not supported by anything that could reasonably be called a "plan." In fact, they appear on a one-page document that simply states goals without explanation or resources. The MDOE has not produced resources, detailed action plans or a network of professional development providers. Rather, the MDOE has devolved the responsibility for designing and pursuing professional development to the individual educator and to school districts with little or no guidance. The implicit message is that such professional development plans are unimportant. Since most districts have not created professional development plans, it would appear that the message has been received.

The MDOE has an obligation to create a sound State Professional Development Plan that is standards-based. The National Staff Development Council (NSDC) has created such standards that are "aimed at giving schools, districts and states direction in what constitutes quality staff development for all educators. The bottom line is that staff development must shift from counting how many staff participated and whether they enjoyed the session to determining whether the system is improving student achievement." (NSDC, 2000) These standards include:

1. aligning staff development with school and district goals to improve education;
2. establishing priorities on what issues to address using student data;
3. providing follow-up and support;
4. addressing the need for quality education for all children, regardless of race, ethnic background, gender or special needs through staff development;
5. emphasizing a challenging, developmentally-appropriate core curriculum based on content and outcomes established by schools, parents and community; and
6. promoting parent and family involvement in education through staff development. (NSDC, 2000)

In summary: **High quality, systemic professional development for teachers is essential if education reform is to succeed. The Legislature in the enactment of the Education Reform Act of 1993 and through subsequent budgets has acknowledged the integral role of professional development in the reform agenda. Initially, the MDOE recognized this fundamental element of reform. However, the MDOE did little to live up to its rhetorical endorsement of professional development. Thus, the prediction that "without strong staff development programs that are appropriately designed a very low level of implementation occurs" may be the reality.**

District Professional Development Plans

The *Glossary, District Professional Development Plans, Massachusetts Department of Education* (2000) to superintendents, principals, and the heads of charter schools, states that

> School districts are required annually to adopt and implement a professional development plan for all principals, teachers, other professional staff employed by the district and school council members. Districts are also required to set forth *a budget* for professional development within the confines of the foundation budget. The plan should *identify specific content to be addressed, including training in the teaching of the curriculum frameworks and other skills* required for the implementation of the Education Reform Law, including *participatory decision making* and parent and community involvement (Massachusetts General Laws, Chapter 71, Section 38Q). [emphasis added]

Researchers reviewed the plans on file with the MDOE twice: once in December 1999 and again in September 2000. This review was focused on the plans containing three essential elements:

1. Goals related to the implementation of education reform.
2. Professional development activities related to these goals.
3. A budget supporting the activities and goals.

A CEQ review found 239 district professional development plans from 217 districts on file with the MDOE and obtained by the MTA through discovery for a pending lawsuit (Appendix H). These dated from 1994 through the present. By June 2000, there should have been 1,974 plans written: six annual plans for each of the 329 districts. The findings include

- ✓ Eighteen districts submitted more than one annual plan
  - ✓ Fifteen of these districts submitted two plans – 12 of these for the 1997-98 and 1998-99 academic years.
    - ✓ One of these districts had two plans that contained the three components itemized above.
    - ✓ One of these districts had one plan with the three elements.
    - ✓ Three of these districts submitted two plans for the 1998-99 and 1999-2000 school years.
- ✓ Two districts submitted three annual plans covering 1997-2000; none of these fit the definition of a "plan" as articulated above.

	Professional Development Plans on File with MDOE					
	94-95	**95-96**	**96-97**	**97-98**	**98-99**	**99-00**
Total **all districts**	1	4	2	38	183	13
All districts, %	0.3	1	0.5	12	56	4
All districts, three components				1	9	3
All districts - three components, %				0.3	3	0.7
Total **sample districts**		2		9	36	1
Sample districts, %		4		16	69	2
No. **sample districts,** three components					2	
Sample districts - three components, %					4	

Table 2: Analysis of district professional development plans on file with MDOE from 1994-2000.

Table 2 presents an analysis of the number of plans filed with the MDOE in each year since the passage of the Education Reform Act of 1993. Four years passed without any significant compliance with this element of the law. However, in an MDOE report entitled *Trends in Professional Development* dated March 1996, the statement is made that "at least 50 districts have voluntarily submitted their professional development plans to the Department." Yet, according to the MDOE's own files, only 5 such plans had been submitted by the time of this report. This is the sole MDOE report of either preliminary or final research on effective school district professional development design or delivery.

In May 1998, Interim Commissioner Frank W. Haydu wrote a memo to superintendents and charter school leaders. In it, he indicated that a requirement for receiving a grant from the Dwight D. Eisenhower Professional Development Program and the Technology Training and Professional Development Program was to submit the district professional development plan to the MDOE. This accounts for their being 183 plans submitted for the 1998-99 academic year. In the following year, when there was no such reminder, only thirteen plans were submitted.

While some of the 239 plans on file did contain one or more of the three elements, an analysis of these resulted in the following findings:

- ✓ 48% could not be called "plans" at all. Some were letters outlining the district's plan to create a plan; listings of district or provider workshops available to educators; compilations of recertification information and district forms; and broad mission statements.
- ✓ 82% had no statement of district goals. Some of the goals listed actually applied to students and not staff; many were overarching goals such as "creating a community of learners," which, while laudable, does not direct activities that focus on education reform.
- ✓ 79% had no reference to or evidence of a needs assessment or participatory decision making, a mandated element under the law.
- ✓ 29% had some reference to a budget. Where such a reference was found, it ranged from a complete school district budget to a single figure. In one case the budget indicated that all of the funding would be used to purchase textbooks, which is disallowed under the guidelines. In another instance, the plan indicated that rather than spending the $100 per student as required, the district would spend only $10 since that was deemed "reasonable."
- ✓ 5% included the three identified elements of a professional development plan.
- ✓ 3% included a process for on-going evaluation of the district's professional development program.
- ✓ 1%, only 3 plans, had goals directly related to activities that were supported by a budget.

Beyond this analysis, however, is a more disturbing finding. The school districts that submitted plans did so in good faith. The plans range in length from one-page that was essentially a diagram with a hand-written note scrawled across the bottom reading "more to come" (this district never did send anything else in) to a 334-page document that included reams of information - but was not a professional development plan. It is apparent to even a casual reader that districts were floundering for guidance and none was offered. [3]

In the twelve MDOE Coordinated Program Reviews (CPR) conducted in 1998-99 and 1999-2000 – and provided to the Massachusetts Teachers Association as part of discovery for a pending lawsuit, the only years for which compliance with education reform was part of the district audit, nine districts were found to have a professional development plan. [4] The CPR did not, however, provide an in-depth analysis of the plans, but only reported that there was one and made some evaluative comments, such as

- ✓ "The failure to link the professional development plan to assessment results, evaluations, and other data may result in the failure to present teachers, administrators and other professionals with training that will assist them in meeting high expectations and standards."

- ✓ "The Curriculum Perspectives Report does not constitute a professional development plan. District goals with timelines and a budget for their implementation are not articulated. The district's report does not indicate how specific professional development offerings are linked to student assessment results of either state- or district-mandated testing."
- ✓ "The district does not have a formal plan that articulates long-term goals, timelines and persons responsible for professional development."
- ✓ "The review team found no evidence that the plan is linked to administrative performance evaluations."
- ✓ "The district's professional development plan is a comprehensive, collaboratively designed multi-year program of professional development tied directly to higher standards for student achievement and the State Professional Development Plan." [This was one of the plans that researchers found contained the three essential elements.]
- ✓ "The district has not adopted a professional development plan."
- ✓ "The district has aligned its professional development plan with the State Professional Development Plan by adhering to curriculum frameworks and participating in curriculum mapping." [No plan was on file with MDOE from this district.]

To ensure that districts were equipped to develop and implement meaningful professional development plans, the MDOE needed to provide systematic training for all districts. The review of the professional development offerings (Appendix D) the MDOE has provided since 1995 revealed two three-session offerings entitled "The Art of Designing Effective Professional Development Plans." The sessions were scheduled one day in March, April, and May 1996. Each session would serve eleven school districts for a total of 22 (out of 329 school districts) in the Commonwealth. Only 6.6% of the school districts in the state were able to attend the training provided by the MDOE. The training was not offered again.

In reviewing the Commissioner's Mailings (Appendix B), it was found that on two occasions there was a reference to such plans:

- ✓ On May 21, 1998, Interim Commissioner Haydu wrote to superintendents (Appendix B) providing guidelines and a format for district professional development plans. The mailing outlined legal requirements and made additional suggestions.
- ✓ On October 5, 1998, Commissioner David Driscoll wrote that the "State Plan for Professional Development addresses appropriate professional development expenditures."

Given the lack of compliance on the part of districts to this requirement of the Education Reform Act, it is unclear as to the importance placed on these documents by the Commissioner and the MDOE.

In summary: **School districts have not created annual professional development plans for the teachers, administrators, paraprofessionals, and school council members as the law requires. It is clear that the MDOE provided inadequate guidance and oversight. Nor did the MDOE assign any sanctions for districts that did not comply with this requirement. It would also appear that the MDOE inaccurately reported the degree of district compliance in the one research study that was conducted.**

District Professional Development Expenditures

Mathematics teachers are required by law and regulation to engage in professional development in order to renew their state teaching certificate. Districts are charged with the responsibility of providing professional development at "no cost" in order for teachers to meet this "recertification" requirement. The Education Reform Act of 1993 requires that districts spend specific amounts of money on professional development each year and that these expenditures be related to district and school goals and needs as well as to the goals outlined in the State Professional Development Plan.

FY99 is the last fiscal year for which data on actual expenditures for district professional development are available from the MDOE. In FY99 districts were required to spend an amount equal to $100 per student on professional development for administrators, teachers, paraprofessionals, and school council members (Appendix H). The districts in this study report expenditures ranging from a high of $161 per student to a low of $0. The average expenditure was $97.50.

For all school districts in the Commonwealth, the MDOE statistics indicated that only 65% spent the required $75 per pupil in FY98; 54% spent the required $100 in FY99. Only 28% have budgeted the mandatory $125 per pupil expenditure in FY00 (Figure 4).

In FY98, 63% of the sample survey districts spent the required $75 on professional development activities. In FY99, 61% spent the required expenditure. For FY00, only 19% of these districts budgeted the required expenditure on professional development.

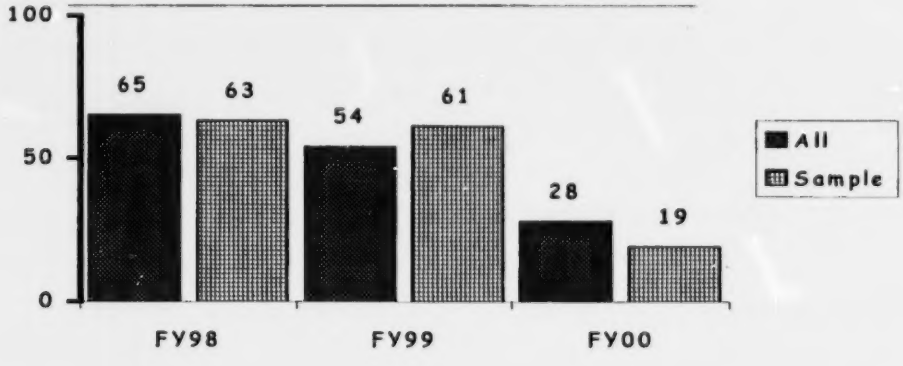

Figure 4: Percentage of actual expenditures in FY98 and FY99 and budgeted expenditures for FY00 for professional development in all districts and in the sample survey districts.

Looking at the total professional development expenditures for the three years under review, 56% of all districts – and 56% of the sample districts – spent or budgeted less than the required $300 per-pupil expenditure on professional development. 19% of all districts – and 21% of sample districts – spent or budgeted the minimum. 25% of all – and 23% of the sample districts – budgeted 10% more than the required expenditure. A review of the Commissioner's Mailings (Appendix B) over five years shows two

occasions (June 16, 1995 and October 5, 1998) on which superintendents were reminded of the requirement to expend specific amounts on professional development.

These findings are supported by an article in the *Boston Globe* (July 7, 2000) which reported that "a large and increasing number of Massachusetts school districts are spending less on teacher training than state law requires - a shortfall many educators believe will short-circuit efforts to help students score higher on MCAS tests."

The Education Management Accountability Board (EMAB) was established in February 1997, through Executive Order 393. "The order requires the Massachusetts Department of Revenue, Division of Local Services, to audit school districts within the Commonwealth of Massachusetts. Audits are undertaken in order to monitor how these districts have progressed under the Education Reform Act of 1993. The EMAB approves all audit protocols, audit selections, audit reports, and policy matters regarding the Executive Order. The audits include, but are not limited to the following areas: (1) school finances; (2) staffing; (3) test scores; (4) time & learning standards; (5) school improvement and technology plans." (Bureau of Education Audits, 2000)

The EMAB audits report that districts consistently underspent in the area of professional development. The Education Reform Act of 1993 mandates that a superintendent file a letter with the Commissioner of Education if the school district fails to spend the specified amounts for professional development and new textbooks. In that letter, the superintendent must detail the reasons for the district's failure to meet the recommended expenditures. The EMAB found that the MDOE has not done anything to enforce this provision of the law. None of the audited districts had complied with the law. In each of the audited districts, the superintendent reported being unaware of the requirements of this provision of the law. In all 18 audits, the district had not filed the required letter with the MDOE and the Commissioner's office had neither informed the district of the requirement nor taken any steps to determine whether a letter was required.

In summary: **The MDOE and the Commissioner of Education have ignored their own obligations under the law and have done virtually nothing to ensure that districts comply with the professional development expenditure requirement. Districts have not met their legal obligations to spend specified amounts of money on professional development for teachers and administrators. Again, while districts had this obligation there has been little leadership or training from the MDOE to demonstrate to district administration how these funds were to be expended. Nor have there been sanctions for districts who did not spend adequately or appropriately.**

Mathematics Professional Development Activities

In a memo to superintendents dated September 13, 1998, MDOE Commissioner David Driscoll wrote:

> "Each district is also required by law to adopt, budget for, and implement an annual professional development plan to train its teachers, administrators, and professional staff 'in the teaching of new curriculum frameworks and other skills' required for the effective implementation of the 1993 Education Reform Act (General Laws Chapter 71, Section 38Q). A

top priority of the Department of Education is to support and assist educators and communities across the state to use the state curriculum frameworks and the information gained from the Massachusetts Comprehensive Assessment System to improve student learning. As a result, the Board of Education adopted the State Plan for Professional Development in June 1998. The Board has identified three priorities for professional development this year:

- expanding educators' knowledge of subject matter;
- increasing educators' knowledge of standards-based curriculum, instruction, and assessment; and
- analyzing and reducing the gap between goals for student achievement and students' actual progress."

This study's survey focused on the actual professional development provided by districts to teachers of mathematics in five key areas directly related to these three priorities of the 1998 State Professional Development Plan.

Teacher association leaders report that districts are not providing all teachers of mathematics with the professional development necessary to prepare students for success on the MCAS Mathematics test. Specifically, when asked if districts have provided the kinds of professional development that would be necessary for mathematics teachers to effectively implement the requirements of education reform, the respondents indicated that (Figure 5)

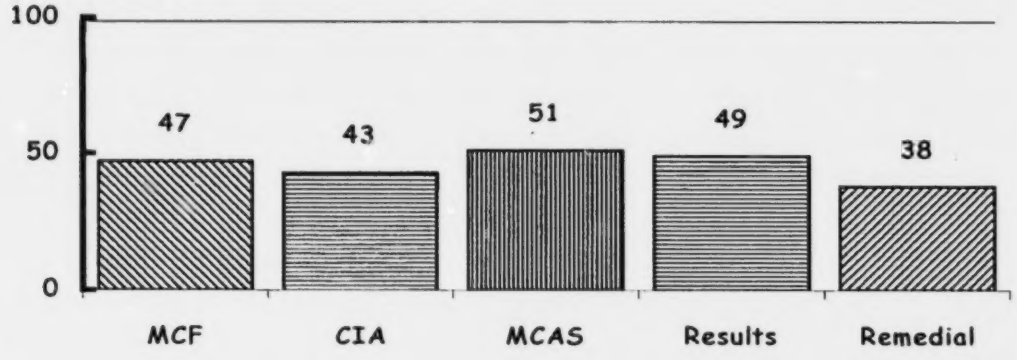

Figure 5: Percentage of districts providing some professional development training in five key areas needed for the systemic implementation of the Mathematics Curriculum Framework.

- ✓ 47% of districts provided some training in the Mathematics Curriculum Frameworks (MCF). Teachers would understand the content of the strands and standards of the Framework as applied to the grade level(s) and specific mathematics course(s) they teach.
- ✓ 43% of districts provided some training in standards-based curriculum, instruction and assessment (CIA). Teachers would develop the knowledge of the philosophy underlying the "standards movement" and skills related to the content and teaching methods associated with standards-based instruction.
- ✓ 51% of districts provided some training in the components of the MCAS Mathematics test (MCAS). Teachers would learn how to develop and assess the various types of questions asked of students on the MCAS mathematics test so that they may prepare their students to do as well as possible.

- ✓ 49% of districts provided some training in the interpretation of MCAS Mathematics results (Results). Teachers would gain an understanding of "data-based decision making" which allows them to understand how to interpret various responses on the MCAS in order to help specific students.
- ✓ 38% of districts provided some training in remedial mathematics plans (Remedial). Teachers would come to understand the concept of "remediation" related specifically to mathematics and the need to create individual plans for students to address their individual deficiencies coming from the interpretation of MCAS results.

Much of the training provided by districts has been in the form of one-day or half-day workshops with no follow-up sessions; some training occurred during after-school faculty meeting time. More than half of all teachers of mathematics have **not** been provided with **any** of the professional development necessary for them to gain the knowledge and skills necessary to effectively implement the Mathematics Curriculum Framework in their classrooms. Those who have had some type of training report that it has not been comprehensive or sustained over time; it has not been supported by coaching and mentoring; and that there has been no formal implementation period for learning new curriculum and methods.

Haney (2000) asked a number of nationally known scholars and reformers the question: *In light of current educational reform ideas, the system decides that it needs to move beyond basic skills teaching to focus in the future on problem solving, higher order thinking skills, making inferences and drawing conclusions. How long would it take and what are the key ingredients?* [5] The responses ranged from 5 to 20 years to transform a school from one focusing on the lowest common denominator to higher order thinking skills. For such a change to occur in a brief (5 years) period time, Hank Levin (in Haney, 2000) noted,

> "that this sounds overly optimistic, but consider a system in which there are continuous staff development, continuous support and technical assistance, administrative encouragement, intrinsic and extrinsic incentives, public information on results, and a culture of commitment. Add to this transformation of local teacher training programs, careful selection of new teachers, and a strong public relations campaign, and things will move. Every administrator will have to become a cheerleader."

The training cited above must be seen as an initial step in the process of transforming schools from those focusing on basic skills to those focused on higher order thinking skills. Any district professional development program must be strategically planned over a number of years; there must be consistent leadership. Educators must persevere through difficult adoption problems and must be willing to rethink elements that "look good on paper" but don't work in reality. In order for a single curriculum framework to be implemented the Levin list provides guidance. Districts – with leadership provided by the MDOE – must begin to provide such training to all mathematics teachers.

In summary: **Most mathematics teachers have not received the training in areas critical to the successful implementation of the Mathematics Curriculum Framework. Districts are not providing teachers with this training. Nor are districts thinking strategically about the implementation of such a profound "sea change" that the Education Reform Act requires. At this point, it can be concluded that the MCAS Mathematics test may or may not be measuring what teachers are teaching or what students are learning because the local curriculum may or may not be aligned with the Mathematics Curriculum Framework.**

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Graduation Requirements

In order to pass the Grade 10 Mathematics MCAS test, students must be proficient in both Algebra I and Geometry. However, only 55% of the respondents report that both Algebra I and Geometry are required courses for high school graduation for all regular education students in their school district. From the teacher leaders reporting, it would appear that school districts have not yet focused on passing the MCAS as a graduation requirement.

In summary: **Districts are not mandating graduation requirements that prepare students to achieve on the Grade 10 MCAS mathematics test.**

Leadership and Building Capacity

The public school system in Massachusetts is comprised of over one million students in over 1800 schools in 329 school districts. In order to implement systemic change affecting the manner in which students learn mathematics, a methodical process must be established at the state level to bring all schools and districts to the same goal: preparing students to succeed on the terms set by the system, which to date means MCAS. To do this the Board of Education directs the MDOE to take certain steps. The MDOE should be providing the leadership to the 329 districts to first build and then increase capacity at the local level. These steps should result in a three-phase implementation of the requirements of the Education Reform Act of 1993. Phase I is the focus of this study.

Phase I: Developing and Implementing Learning Standards

This phase focuses on setting the standards and ensuring that all professional educators in public schools are ready for the "high stakes" which follow. The steps in Phase I should include:

- Developing curriculum frameworks with clear learning standards that are broadly accepted as essential in the field;
- Disseminating the frameworks documents to every educator;
- Communicating the purpose and importance of these documents to all educators through multiple vehicles (workshops, seminars, web page, email, print, videotape, etc.);
- Training all educators on the content and purpose of the frameworks through quality professional development;
- Assisting districts to develop professional development programs that provide the kind of training necessary for math instruction under education reform;
- Developing implementation timelines for districts with measurable benchmarks;
- Ensuring that districts comply with required expenditures for textbook adoption;
- Ensuring that districts comply with required expenditures for professional development;
- Ensuring that the first phase of education reform is achieved before the second "high stakes" phase begins; and
- Identifying districts having difficulty with implementation and providing assistance to them.

Phase II: Development and Tryout of Massachusetts Comprehensive Assessment System

Once the frameworks are in place and the learning standards are understood and accepted, a multiple assessment measures (including a diagnostic tools that will inform teachers, students, and parents as to what students know and are able to do) should be developed. The multiple assessment measures should provide schools and districts with performance data about individual students and cohorts of students so that

- Curriculum and instruction can be adjusted to match the standards being tested;
- Individual students with learning needs can be identified and remedial plans put in place;
- Groups of students with specific learning needs can be identified and remedial programs can be developed and put in place;
- Parents can be informed about the learning needs of their child(ren) and provided with guidance as to how they can assist in improving student performance; and
- Districts can reallocate human and budgetary resources to identified areas of need.

Phase III: School and District Accountability System

Once the frameworks and the multiple assessment measures are in place; once students, parents and teachers understand how these assessment tools are constructed; once students, parents and teachers understand how student results will be scored and reported, then a school and district accountability system should be devised that

- Measures school improvement in relation to student achievement;
- Informs the work of teachers and administrators and policymakers;
- Utilizes a range of data sources that present a total picture of student achievement;
- Observes the rules of fair-mindedness; and
- Is not punitive.

The Board of Education

According to Massachusetts General Laws (*Chapter 69, Section 1B)*, "the board shall establish policies relative to the education of students in public early childhood, elementary, secondary, and vocational-technical schools."

The Board is charged with setting the agenda, the timetable, and approving any regulations required for implementing education reform. There has been a sense of "musical chairs" at the Massachusetts Board of Education since the passage of the Education Reform Act of 1993: the leadership has been unstable. Since the passage of the Education Reform Act of 1993, there have been three chairpersons of the Board: Martin Kaplan, John Silber, and James Peyser. With the appointment of John Silber, the 21-member Board was reduced to nine members. During the same period, there have been two Commissioners of Education: Robert Antonucci and David P. Driscoll. There has been one Interim Commissioner Frank W. Haydu, III. The commissioner is appointed by the Board and answers to the Board.

An analysis of the reported decisions and discussions of the Board as described in *The Board in Brief Reports* from **May 1995 through May 2000** (Appendix B), shows that the Board has spent a disproportionate amount of time on the issues of assessment (Phase II) and accountability (Phase III) and virtually no time on district implementation of curriculum frameworks (Phase I).

From May 1995 through June 2000, there were 56 Board of Education meetings. *The Board in Brief* notes that at

- 10 meetings – curriculum frameworks were discussed or voted on – six involved the Revised Mathematics Curriculum Framework finally approved in July 2000;
- 14 meetings – assessment, especially as it relates to MCAS was on the agenda;
- 13 meetings – school and district accountability was a topic;
- 4 meetings – professional development as it relates to recertification was discussed; and
- 1 meeting – informing the field was a topic of discussion.

When aggregated (Figure 6), at 64% of the Board's meetings the discussion focused on assessment (TEST) and accountability (SDA); at 24% it centered on curriculum frameworks and learning standards (CF); and at 12% it focused on implementation based topics – professional development (PD) and communicating with the field (FIELD). Sixty percent of the Board's discussions about frameworks addressed the content of the newly adopted Revised Mathematics Curriculum Framework specifically.

Clearly, the Board has given short shrift to Phase I implementation of education reform. As a result, the Board has failed to ensure that school districts are implementing the state mandated curriculum frameworks. Instead, the Board has chosen to focus almost exclusively on assessment and accountability – Phases II and III of education reform without taking any steps to ensure that

- Districts have aligned curriculum;
- Schools have provided training and materials; or
- Teachers are instructing the material on which students will be tested.

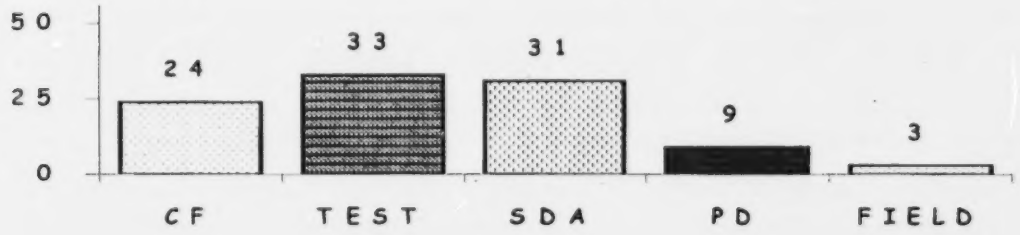

Figure 6: Analysis of the number of Board of Education meetings from 1995-2000 at which time and attention – as measured by decisions and/or discussions – focused on the five elements of Education Reform: Curriculum Frameworks; Assessment; School and District Accountability; Professional Development; and Informing the Field.

With the first administration of the MCAS exam in 1998, the appointment of John Silber as the new chairperson, and the reduction in the size of the Board, the attention of the Board and the MDOE turned away from implementation and toward accountability. No longer was the Board focused on districts learning how to implement the frameworks and the means by which districts should adopt them. Its agenda became performance levels, cut scores, school and district accountability. As a result of the Board's agenda, the "technical assistance" the MDOE is charged with providing to districts has not materialized..

More significantly, the Board is neither representative of nor connected to teachers and administrators in the field. When public comment is solicited –as required by law – it is essentially ignored. The most

recent example was the enormous outcry from mathematics teachers, principals, parents, students, and teacher educators – including the president of the National Council of Teachers of Mathematics – speaking out against the Revised Mathematics Curriculum Framework, and yet, the Board voted 8-1 to adopt it.

In summary: **The Board of Education has focused its attention almost exclusively on assessment and accountability. Its agenda has become: performance levels, cut scores, school inspections, and district accountability. In the process, the Board has effectively removed the implementation phase of education reform from its agenda. It has failed to recognize that an on-going conversation with the teachers and administrators in the field is an essential component of implementation and accountability.**

The Department of Education

According to Massachusetts General Laws (*Chapter 69, Section 1A)*, "There shall be a department of education, hereinafter called the department, which shall be under the supervision and management of a commissioner of education, hereinafter called the commissioner." The law goes on to say that "the commissioner shall receive reports, undertake research, and facilitate coordination among and between school districts." Further, "the commissioner shall assess the effectiveness and monitor the improvement of the public schools in each district, including charter schools."

For the purposes of this study, the Massachusetts Department of Education (MDOE) will be the focus of discussion since the agency has remained constant while there have been two commissioners and one interim commissioner from 1993 to the present.

Under the Education Reform Act of 1993, the MDOE is charged with implementing all aspects of education reform. This provision is consistent with the experience of teachers and administrators, who have historically looked to the MDOE for information and guidance related to educational issues.

A review of the 99 Commissioner's Mailings (Appendix B) sent to superintendents and charter school leaders between **June 1995 and June 2000**, illustrates that over these six years the MDOE has moved away from its role as director of reform and has become a rule-making entity (Figure 7). The single greatest topic that is addressed more than all others in the Commissioner's Mailing is *informing the field*: providing teachers, principals and superintendents with essential information about fundamental issues and essential documents directly related to the operation of schools and school districts. This has become an even more prominent topic during the tenure of the current Commissioner.

- ✓ 31% of the mailings addressed informing the field;
- ✓ 25% focused on professional development issues;
- ✓ 13% on curriculum frameworks and their revisions;
- ✓ 21% on assessment, especially that related to MCAS administration and scores reporting; and
- ✓ 10% to school and district accountability.

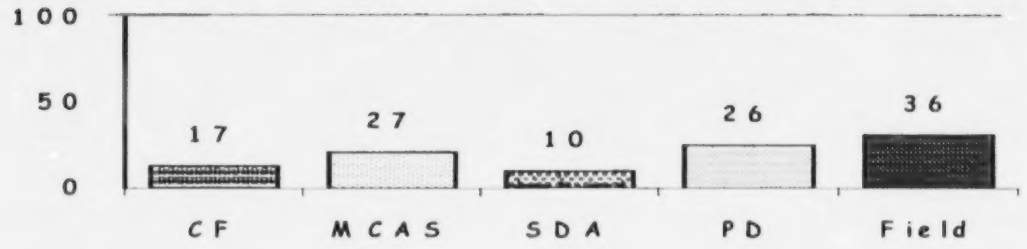

Figure 7: Analysis of content of the Commissioner's Mailings - from June 1995 to July 2000 - related to the five elements of Education Reform: number of references to Curriculum Frameworks; Assessment; School and District Accountability; Professional Development; and Communication with the Field.

While it would appear reasonable that the Commissioner would inform the field about aspects of education reform, upon closer examination it becomes clear that most of the items about *informing the field* in the Commissioner's Mailings to superintendents and charter school leaders actually focused on the means by which the MDOE intends to inform the field about elements of education reform. In fact, the MDOE demonstrates little interest in effective, on-going communication with teachers and administrators on matters of substance related to education reform.

In summary: **The Massachusetts Department of Education has demonstrated little interest or ability to engage in effective, on-going communication with teachers and administrators in the field on matters of substance related to education reform. Rather the MDOE appears only to "tell" educators where they may find the essential information required for the implementation of education reform. A working partnership between the state agency and the field, that was the hallmark of the first few years of reform, does not now exist.**

Department of Education Professional Development Activities

The number and location of MDOE professional development offerings from 1995-2000 were analyzed to determine whether the distribution matches student population. While there is no clear measure of teacher-to-student ratio or administrator-to-student ratio across the state, percentage of student population by region provides some measure of consistency from area to area.

Since the passage of the Education Reform Act of 1993, the MDOE has provided three types of professional development that are relevant to this study:

- ✓ Training related to elements of education reform in general (Appendix C) in the form of single or multiple day workshops;
- ✓ Training related to mathematics and science together (Appendix D) in the form of summer content institutes; and
- ✓ Training related to mathematics only (Appendix D) in the form of summer content institutes.

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Region	Professional Development Activities by Subject, Offerings			Totals			
	Education Reform	Math and Science	Math Only	Total # of PD Offerings	% of Whole	Students by Region	% of Whole
Cape and Islands	1	1	2	*4*	*3*	*35,911*	*3.8*
Central Mass.	27	7	11	*45*	*34*	*190,895*	*20.2*
Northeast Mass.	14	5	14	*33*	*24*	*354,385*	*37.5*
Southeast Mass.	10	6	5	*21*	*26*	*230,586*	*24.4*
Western Mass.	13	6	10	*29*	*22*	*133,249*	*14.1*
TOTALS	**65**	**25**	**42**	**132**	**100**	**945,025**	**100**

Table 3: Regional breakdown of MDOE professional development activities offered from 1995 through 2000 in education reform, mathematics and science, and mathematics only compared with percentage of actual student population by region.

Table 3 indicates the student population and percentage of the whole in each of these five regions of the Commonwealth: Cape Cod and the Islands (CC), Central Massachusetts (C), Northeast Massachusetts (NE), Southeast Massachusetts (SE), and Western Massachusetts (W). In addition, there is a breakdown of the number of professional development activities offered by the MDOE in each region. These workshops include all education reform, math and science, and math only offerings: multi-day workshops, half-day sessions, single-day sessions, and summer content institutes. It should be immediately apparent that the number and frequency of all of these workshops, institutes, and trainings was inadequate to bring about the systemic change required for education reform to be successfully implemented in the state's 329 school districts.

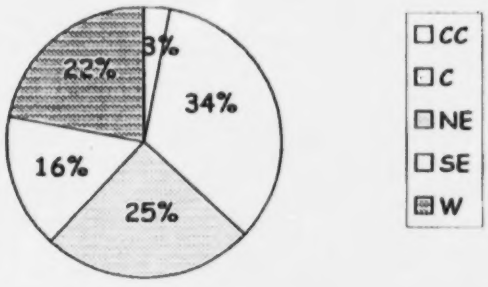

Figure 8: **Total MDOE Professional Development** from 1995 – 2000 by region.

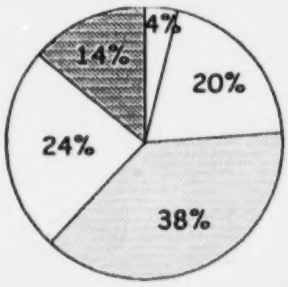

Figure 9: Percentage of **Student population** by region.

An analysis of each of the five regional areas of the Commonwealth is provided in Table 3 and Figures 8 and 9. In comparing the data in Figure 8 - MDOE professional development activities by region – to that in Figure 9 – student population by region – it can be observed that the MDOE's offerings were disproportionately located in the Central Region which has 20% of the students but had 34% of all professional development. Although from a statewide perspective, Worcester County is centrally located, it is burdensome to educators from across the Commonwealth, even to those in the northern tier of central

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Massachusetts, for all MDOE offerings to be located outside of their immediate area. For the most part, the MDOE activities were held along the Mass Pike corridor in Worcester, Auburn, and Sturbridge – all along the southern border of the state.

Northeastern Massachusetts has the highest percentage of students, yet the offerings were significantly disproportionate in each category. In general, this region is the home to 38% of the student population, yet had only 25% of the MDOE professional development. There are four urban areas in this region – Boston, Lawrence, Lowell, and Lynn – all with high math failure rates, yet little was offered in these communities.

Southeastern Massachusetts is home to approximately one-quarter of the student population, yet this region was also disproportionately underserved by MDOE professional development activities especially in the area of Mathematics only. There are two older communities – Fall River and New Bedford – both of which have had middle schools placed "under review" by the MDOE. Most of the training in this region was conducted in Bridgewater and Mansfield, not in the urban centers which have been identified as needing assistance.

Cape Cod and the Islands, while having the smallest student population, have the most remote geography in the state. Martha's Vineyard and Nantucket both had significant math failure rates, yet no training was provided to either of these unique island communities.

Finally, Western Massachusetts has 14% of the student population and a disproportionately larger number of the MDOE professional development activities (22%). However, most sessions took place in the Springfield – South Hadley – Northampton area. Very little was offered in the more geographically isolated Berkshires.

MDOE Education Reform Professional Development: The MDOE offerings during 1996 were primarily multi-day workshops for school or district teams (Appendix C) focusing on developing leadership capacity, professional development planning, technology initiatives, and study groups. Workshops were held primarily in eastern Massachusetts with only one training session west of Worcester. After the Board of Education approved the Mathematics Curriculum Framework in December 1995, the MDOE sent copies to local school districts, which were charged with explanation to teachers regarding their content and use. Initially, the MDOE funded Education Reform Study Groups at the district and regional level. However, these groups were short-lived, and it is unclear if they were successful and by what standards.

In 1997, the MDOE again offered workshops for district teams, again primarily in Worcester County and Eastern Massachusetts. There were fewer offerings and most were one-day workshops. In 1998, The MDOE focused almost exclusively on MCAS with half-day sessions conducted during the school day for teachers and administrators in separate sessions. There was nothing offered in 1999. In 2000, the MDOE conducted one session related to recertification which was held in central Massachusetts during the school day.

MDOE Mathematics and Science Professional Development: An annual analysis of the MDOE professional development offerings specifically for mathematics teachers since the adoption of the 1995 Mathematics Curriculum Framework is reported in Table 4.

No clear pattern or strategy emerges from analyzing this data. In looking at the topics covered, it appears that some programs – Everyday Mathematics for Grades K-5, Connected Mathematics for Grades 6-9, Connected Geometry for Grades 6-12, and Interactive Mathematics for Grades 9-12 – seem to be offered a number of times. Yet, given the high failure rates in grades 8 and 10 across the state, there is no push to focus on middle and early high school grades as a means of solving the math problem.

Grade Span	1996	1997	1998	1999	2000
K-5			1	1	3
K-8			1	2	
K-12	2	3	1		
Gr. 3-5	1		1	1	
Gr. 6-9				1	5
Gr. 6-12	1	2	3		1
Gr. 9-12	3	4			
Maximum number of Teachers that could be served	**280**	**346**	**246**	**182**	**252**

Table 4: Annual distribution of MDOE Mathematics Professional Development offerings (1996-2000) and the maximum number of teachers that could be served.

Many of the workshops appear to fit the needs of professional development providers offering the instruction rather than meeting the needs of many school districts. One summer 2000 offering, *Navigating the Math and Science Standards for Middle through High School*, would appear to meet the needs of all districts; yet it was offered only once and only in the Northeast. While another offering, *Maritime Mathematics*, does not appear to address the identified need to improve mathematics achievement for 8th and 10th graders.

Participation in all of these professional activities is voluntary and open to those teachers who have the time and the means to commit to a summer program. The participants, while earning professional development points, are not compensated for participation. Some of these offerings cost $450 per person.

Since the release of the first MCAS test scores, the MDOE has been maintaining that this is "powerful" data that districts can use to improve student achievement. Yet, the MDOE has offered no systemic professional development in the interpretation of this data and its use in developing either new curriculum or remedial plans. Districts are provided with raw data and CD-ROMs and left to their own devices as to how to use each. The MDOE is assuming that each district has the expertise to do this work, or is indifferent to the fact that most districts do not have such expertise.

In summary: **Stunningly, especially in light of its recent decision to test certain mathematics teachers, the MDOE has offered inadequate statewide professional development directly related to the frameworks in general, the Mathematics Curriculum Framework in particular, or the essential ingredient of using the MCAS test results to improve student achievement – data-based decision-making. It can be concluded that the MDOE has not aligned its distribution of professional development offerings with teachers' needs.**

Developing leadership in the implementation of education reform and building capacity at the local level specifically related to mathematics do not appear to be fundamental goals of the MDOE's professional development offerings.

There is no "program" related to the State Professional Development Plan. In looking at the schedule of offerings, it is evident that there is no systemic, deliberate and statewide plan guiding the distribution of MDOE professional development. Central Massachusetts received a disproportionate amount of the training at the expense of the Northeast and the Southeast. Workshops and institutes appear to meet the interests of the providers rather than the needs of teachers focused on improving student achievement in mathematics.

Partnerships Advancing the Learning of Mathematics, Science, and Technology (PALMS) Program

The PALMS program predates the adoption of the 1995 Mathematics Curriculum Framework. It would appear that the MDOE has relied almost exclusively on the training related to the Mathematics Curriculum Framework document through the PALMS program for district leaders. In the PALMS Program Effectiveness Report 1998-1999, the MDOE reports that 177 of 329 (53.8%) school districts had participated in PALMS. A review of the member districts on four of the five regional offices web sites indicates that ninety-nine districts are members of the PALMS; the central provider does list the school systems on their web site. A query to MDOE about the membership in PALMS yielded the response, "At this point we consider all Massachusetts districts to be PALMS districts. Early on, we kept track of PALMS and non-PALMS districts. The PALMS list grew and grew to the point where services are provided via our Regional Offices to the entire state."

The PALMS Effectiveness Report states that 354 teacher- leaders –two teachers from each of the 177 districts – and 800 teacher leaders "in training" are "working with standards-based curriculum materials and programs." While PALMS has focused the attention of some educators on standards-based instruction, its mission is divided among mathematics and science and technology. It cannot be determined from the data provided, exactly how many mathematics classrooms – and the teachers and students in them – have been changed as a result of the PALMS initiative.

In the Summer Content Institute 2000 brochure, teachers are directed to the PALMS web page to find out more about professional development opportunities. It would appear that PALMS is returning to the district leader model that was abandoned after the first two years. There were only three mathematics summer content institutes in 2000: none appear to be focused on the issues of implementing the standards at the middle or high school level.

In summary: **PALMS did not serve as MDOE's proxy for bringing about systemic change in the pedagogical skills of mathematics teachers. Although promising initially, the program went in a different direction.**

Infrastructure of Reform: *Communicating with Teachers and Administrators*

Exacerbating the MDOE's lack of attention to Phase I of education reform, is the means by which the MDOE communicates with the field and its response to criticism from the field. Darling-Hammond (1988) in discussing the "reform dilemma" argues that "we have developed a system of schooling that relies on externally developed policies and mandates to assure public accountability. We give voice to democratic control over education through legislation defining what is to occur in schools, administered by bureaucratic agents who prescribe regimens and reporting systems. Within current governance and administrative structures, teachers are accountable for implementing curriculum and testing policies, assignment and promotion rules, and myriad other educational prescriptions, whether or not these treatments are appropriate in particular instances for particular students." The MDOE has created such bureaucratic prescriptions and then disseminated them to the field essentially through superintendents only.

The MDOE over-relies on two means of communication: the Commissioner's Mailings to Superintendents, Principals and Charter School Heads and the MDOE web page. The EMAB Summative Reports indicate that none of the superintendents were aware that certain provisions of the Education Reform Act of 1993 were not being followed; teachers report that they are unaware of certain documents that the MDOE is defining as essential to understanding the mathematics frameworks. It can be concluded that the modes of communication with the field are ineffective. Commissioner Driscoll acknowledged as much in his Commissioner's Mailing of February 22, 2000:

- ✓ "I recently met with the Executive Board of the Superintendents Association and received valuable feedback on the gap in communication between the implementation of a myriad of new initiatives of the Board and the Department, and the inability of districts and schools to absorb it all. After we complete the certification regulations and the framework revisions, we need to take stock of where we are and how we fit all of these initiatives together."

The Commissioner's Mailing is sent at least monthly to all superintendents, principals and charter school heads. The MDOE presumably assumes that school leaders will reproduce and disseminate necessary documents within the school districts. This strategy shifts the cost from the state to the local district. It also relies on an assumption that there exists within every district individuals with the expertise and time to read, interpret, and explain documents to district staff. Many districts – especially small and mid-sized districts – do not have this capacity. An example of this is

- ✓ On August 17, 1999, Commissioner Driscoll wrote, "in this mailing, you will find the following 20 items. Please copy and distribute to your staff."

The MDOE also relies on its web page to disseminate enormous amounts of material to the field – with little or no explanation or prioritization as to meaning or importance. The web page does not convey that some documents are more important than others. This communication mode relies on the doubtful assumption that educators have time to log on daily to figure out what they should be doing to implement the various aspects of education reform. Some examples of this (Appendix B) include:

- ✓ On November 4, 1996, Commissioner Antonucci wrote, "In recent months, I have been trying to streamline the mailings further and have eliminated one of the two bimonthly mailings on occasion, putting information that would have been sent to you on the Internet instead."
- ✓ On October 3, 1997, Commissioner Antonucci wrote, "the History and Social Science Curriculum Framework (PDF) – use Adobe Acrobat Reader."
- ✓ On November 16, 1998, Commissioner Driscoll wrote that "the MCAS test question document is on the Internet and will also be in every public library by the end of the week."
- ✓ On July 8, 1999, Commissioner Driscoll wrote that "the individual school results on the Iowa Reading Test will be included with district results on our web site as of July 16."
- ✓ On September 1, 1999, Commissioner Driscoll wrote that "an update of the reporting schedule for MCAS workshops and the revised foreign language framework were on the web page and required Adobe Acrobat Reader."
- ✓ On September 1, 1999, Commissioner Driscoll wrote that "by now most superintendents and leaders of charter schools and collaboratives are linked to the MDOE web site where documents in these mailings are posted. During this fall, I will phase out mailing hard copies of most items, so that by January 2000 my bimonthly mailings will only include documents that are not easily formatted for the Internet. I urge you and your staff to review and print documents from our web site, which is updated almost every day."
- ✓ On October 1, 1999, Commissioner Driscoll wrote, "in our continuing effort to utilize our technology resources and decrease paper copy, we are posting the 1999-2000 Department of Education Professional Development Calendar. Educators can search the site for professional

development opportunities and obtain registration information. The site will be updated frequently."

In addition, for those who do log on daily, the web page is at times incomprehensible. The use of the MDOE web site as the primary means of obtaining essential documents, its occasional use of videotapes of workshops, and the rare use of MCET broadcasts are poor substitutes for requiring that MDOE staff - who are knowledgeable about curriculum, instruction, and assessment work directly with districts through the implementation phase. Person-to-person communication with the field does not exist. Districts are not assigned an MDOE staff member who is responsible for providing "technical assistance" and who is able to report back to the MDOE on the progress of reform in the district. In reviewing these communications, there is no evidence that the Commissioner requested that each superintendent report on various aspects of implementation so that the MDOE would have a clear understanding what each of the 329 districts had accomplished by certain benchmarks dates.

Adding to the frustration is the response by the Commissioner and MDOE staff to criticism from the field of the agency's policies and regulations. Such criticism is often characterized as "whining." Darling-Hammond (1988) has found in her research that

> "a frustrating state of affairs occurs when states or local school boards adopt inappropriate or poorly constructed textbooks and mandate their use, when standardized curricula are required for students who are not standardized in their needs and stages of cognitive development, when tests that de-emphasize the development of higher-order skills and performance abilities are used to gauge progress and support decisions about students and teachers, and when scheduling and assignment practices reduce teachers' opportunities to create viable conditions for student learning. *Those who resist these practices are often deemed troublemakers, although their challenges to standard operating procedures are precisely what meaningful educational reform and the advance of professional practice require.* [emphasis added]"

In his September 1, 1999 mailing to superintendents, Commissioner Driscoll wrote:

> "I want to address a serious concern I have regarding attitudes toward MCAS. During this summer, I attended several conferences and spoke with many people about issues regarding the state tests, and it is apparent to me that attitudes have generally fallen into two categories.
>
> The first category includes people who are making a great effort to support this program, who are aligning their curricula, who are enlisting educators and parents to learn about and support the program, and who recognize and accept MCAS as a vital tool in our comprehensive school improvement effort. They support the 1993 Education Reform Act that calls upon all of us to ensure that all students learn the state standards and achieve at higher levels. To you, I say thank you for taking your responsibility seriously.
>
> *The other category includes people who are resisting progress by wasting their time and energy raising the same old issues and making excuses. They are not taking MCAS seriously, and they are obstructing the educational progress of students. I urge these people to accept the fact that MCAS is here to stay, and I ask them to work with us, not against us, to continue to move forward on MCAS and the academic standards."*
> [Emphasis added]

It appears that the MDOE reaction to any criticism of policies that educators believe are detrimental to the education reform process and harmful to individual students is a manifestation of Darling-Hammond's finding that such individuals are labeled "troublemakers." The MDOE does not view the field as partners in the reform process. In Darling-Hammond's view, for such policymakers "the 'professional' teacher in common parlance is one who *does things right* rather than one who *does the right thing.*"

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In summary: **The manner in which the MDOE communicates with the field is ineffective. The streamlining of mailings and the posting of essential information on the web page meets the needs of the MDOE staff, but does not in any way address the needs of superintendents, principals and teachers – all of whom need the "technical assistance" that the MDOE should be, but is not, providing. This strategy shifts the cost from the state to the local district. It also relies on the assumption that there exists within every district individuals with the expertise and the time to read, interpret, and explain documents to district staff. Many districts – especially small and mid-sized districts – do not have this capacity.**

More significantly, the MDOE characterizes educators who offer any criticism of its policies as "*people who are resisting progress by wasting their time and energy raising the same old issues and making excuses.*" Thus, the MDOE gives credence to the view that for such policymakers "the 'professional' teacher in common parlance is one who *does things right* rather than one who *does the right thing.*" Without engaging teachers and principals in the real issues confronting students and schools, the reform agenda will not be advanced effectively or equitably.

Infrastructure of Reform: *Working with the Field*

Disturbingly, the MDOE is not working deliberately, systemically or collegially with practitioners in the field. Given the manner with which the MDOE dismisses any criticism of its policies from the field, any meaningful dialogue about education reform between the state agency and educators appears to be a remote possibility at this juncture. This reluctance to engage and work with the field has been in effect since the tenure of the Silber Board. This negative attitude toward the field coupled with the Department's failure to use multiple means of communication and its over-reliance on electronic communication has contributed to a growing disconnect between teachers and the state agency overseeing their work. This failure to provide adequate resources and necessary tools for teachers to successfully implement the standards and the failure to listen to the input of educators has lead to a "rift" between the MDOE and the field. (*Worcester Telegram and Gazette*, June 2000).

More disturbing, is that the MDOE's staff does not meet with teachers on a consistent basis in districts large and small across the Commonwealth. There are few meetings of any kind on any issue of substance. More and more "conferences" consist of single session, large gatherings of 300 or more administrators in a large hotel ballroom where a visual presentation is given by one or two staff members followed by a brief question-and-answer session. The time of such events tends to be from 9:00 – 12:00 so that teachers and principals, for the most part, are unable to attend. The MDOE appears to be focusing almost exclusively on central office administrators and the topic of these sessions tends to be explanations of rules that the Department has developed. Attendees are told they must implement the rules, but there is no real guidance or discussion – or real dialogue. The rules are created by MDOE staff in isolation; they may or may not be put out for public comment. However, when public comment is solicited, comments from the field appear to be ignored in most instances. Most of the Board's rules have to do with accountability. Most recently, two Board decisions were approved over overwhelming opposition voiced by the field through public comments and public forums: one involved adopting a new mathematics framework and a second focused on testing math teachers

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Darling-Hammond (1988) again in discussing the reform dilemma indicates that

> "the problem with instructional policies is not that they are not well-intentioned and sometimes even well-informed; it is that policies by their nature must be uniform, operational through a bureaucratic chain of command, and implemented in a standardized fashion to produce easily measurable results. *Effective teaching, on the other hand, requires flexibility, a wide repertoire of strategies, and use of judgment in complex, nonroutine situations where multiple goals are being pursued."* [emphasis added]

The MDOE's failure to engage the field in a meaningful dialogue about the strengths and weaknesses of its policies undermines the implementation of education reform and widens the existing rift.

Most disturbing, however, is that the MDOE staff is less and less representative of the teachers and administrators in the field. More MDOE staff members have either little or no experience in education. MDOE staff are not conversant in educational policy or the language of education. While the Commissioner is an educator, his two top assistants are an attorney and a researcher. More and more of the administrators of divisions within the MDOE come from fields outside of education and, as a result, have little understanding of the workings of schools beyond their own experience as students or parents of students. Educators are being marginalized and replaced by individuals with no working knowledge of the operations of schools and school districts. This is not the climate necessary for meaningful reform, nor does it advance the goal of improving the performance of the one million students served by the Massachusetts public schools.

Again, Darling-Hammond (1988) argues that

> "policies that define practice are necessarily backward-looking: they must rely on the technologies and knowledge available at any point in time. Slavish adherence to their requirements prevents growth of knowledge and improvement of practice. *When nonprofessionals unaware of the contingencies create policies that influence appropriate decision making or the possibilities for improvement in effective practice, these effects are only exacerbated.* If nonprofessionals through policy mandate regulated medical practice, for example, we might still be treating fevers by applying leeches." [emphasis added]

Yet the MDOE, in allowing nonprofessionals to develop policies that relate specifically to curriculum, instruction and assessment and then in failing to engage in meaningful working relationships with teachers and principals in the schools has, in effect, exacerbated the problem.

In summary: **Disturbingly, the MDOE is not working deliberately, systemically or collegially with practitioners in the field. More disturbing is that the MDOE's staff does not meet with teachers on a consistent basis in districts large and small across the Commonwealth. Most disturbing, however, is that the MDOE staff is less and less representative of the teachers and administrators in the field. Educators are being marginalized and replaced by individuals with no working knowledge of the operations of schools and school districts. This is not the climate necessary for meaningful reform, nor does it advance the goal of improving the performance of the one million students served by the Massachusetts public schools. In allowing nonprofessionals to develop policies that relate specifically to curriculum, instruction and assessment and then, by failing to engage in meaningful working relationships with teachers and principals in the schools, the MDOE has exacerbated the problem of student achievement in mathematics.**

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Conclusions

1. The Board of Education has not provided the direction needed to implement the required elements of Education Reform with regard to the 1995 Mathematics Curriculum Framework.
2. The Board has focused almost exclusively on assessment and accountability without assuring the implementation of the learning standards in schools and districts across the Commonwealth.
3. The MDOE has not provided the leadership, information, training, and resources to schools and districts to successfully implement the requirements of the Education Reform Act of 1993 with regard to the 1995 Mathematics Curriculum Framework.
4. The MDOE has not monitored the implementation of the Mathematics Curriculum Framework at the district level.
5. The MDOE has not determined, through dialogue and work with educators, the reasons for the poor student performance on the MCAS Mathematics test.
6. The Mathematics Curriculum Framework has not been deliberately and systemically implemented in all grades in all school districts in the Commonwealth.
7. A large percentage of districts have not aligned their mathematics curriculum to the framework.
8. A large percentage of districts have not adopted textbooks and materials that are standards-based and reflect the learning standards in the framework.
9. A large percentage of districts have not provided teachers with the adequate resources and the training necessary to teach students the material on which they will be tested.

Recommendations

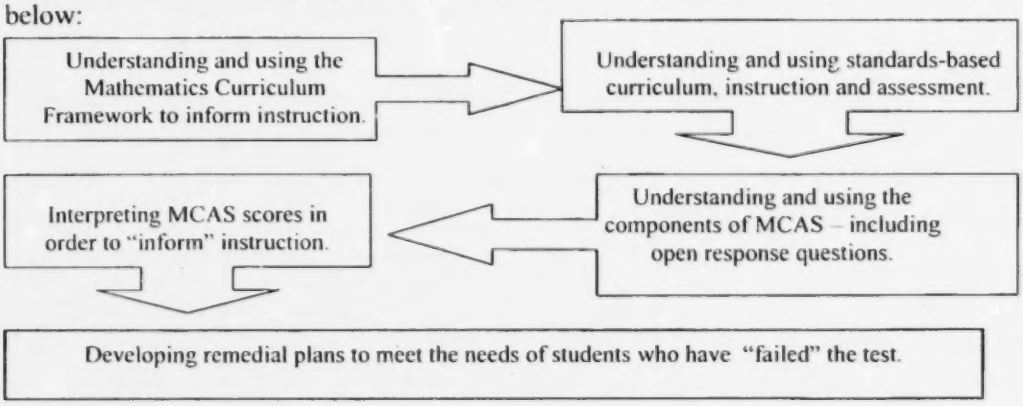
The Massachusetts Department of Education must

- Reestablish a relationship with the field built on trust and mutual respect.
- Broaden its "reach" beyond superintendents and school leaders.
- Hire as staff members educators who are well-versed in the workings of schools and school districts and well-respected by the field.
- Assign each school district in the Commonwealth a Department of Education staff member to act as coach, troubleshooter, and liaison.
- Reestablish regional offices that can serve as professional development centers.
- Adopt stable curriculum framework documents that are "user friendly," relate the learning standards to multiple measures of assessment, and have been approved by the appropriate professional content area associations.

- Provide a reasonable timetable for implementation of the curriculum, instruction and assessment practices necessary for implementation; benchmarks should be attached to the timetable at the K-4, 5-8, and 9-12 levels.
- Create a process by which textbooks can be assessed and information can be disseminated to teachers and department heads.
- Create a calendar of regional meetings for school staff to learn about various aspects of curriculum implementation. These meetings should be held from 4:00 to 7:00 so that all school personnel are able to attend. These meetings should be held in small groups (no more than 50-60 participants) in different geographic areas of the state, including the Berkshires and the Cape and Islands.
- No assessment instrument should not be used as a "high stakes" accountability measure until such time as an outside evaluator has determined that districts have in fact aligned their curriculum and provided teachers with the resources necessary to instruct all students in the content of the learning standards on which they will be tested.
- Create a district professional development plan template for all districts: a uniform format for articulating goals, activities, and budgets. Mandatory training in the use of the template for all 329 districts should accompany its release.
- Return to the PALMS model of teacher-leaders in mathematics at the district level as a means of building capacity; mandate that all districts participate.

Local school districts must

- Provide all teachers with the information and resources necessary to successfully implement the curriculum frameworks.
- Align local curricula to the curriculum frameworks.
- Adopt textbooks that support the strands and standards in the Mathematics Curriculum Framework that are compatible with locally aligned curricula.
- Provide teachers with high-quality professional development to improve student achievement in mathematics.
- Adopt graduation requirements that mandate that all students take and pass the mathematics courses necessary for them to pass the Grade 10 MCAS Mathematics test.
- Provide teachers with high-quality, systemic professional development that is organized so that teachers move sequentially from understanding the frameworks and standards-based education to understanding and interpreting MCAS and the needs of students as illustrated below:


Understanding and using the Mathematics Curriculum Framework to inform instruction.
Understanding and using standards-based curriculum, instruction and assessment.
Understanding and using the components of MCAS – including open response questions.
Interpreting MCAS scores in order to "inform" instruction.
Developing remedial plans to meet the needs of students who have "failed" the test.

Educational Management Accountability Board, or its successor, must

- Continue its fiscal oversight of local school districts through its audits.
- Determine if the Department of Education is implementing all aspects of the Education Reform Act of 1993 in a fair and equitable manner.

The local teachers organization must work with district leaders to ensure

- That there is teacher participation in the development of district goals and district professional development plans.
- That each school develops an improvement plan that is based on participatory decision making and includes improving student achievement as a goal.
- That educators develop individual professional development plans and that districts provide them with "no cost" options as the law requires.
- That teachers participate in the development of aligned curricula.
- That teachers participate in the selection of new textbooks and teaching materials.
- That teachers participate in the articulation of school and district goals.

The state-wide teacher organizations must work with policy makers and local affiliates to ensure

- That policies are developed and adopted that allow teachers and principals to provide students with the educational experiences and resources necessary to ensure that they pass the state assessments.
- That the expertise of educators in the field becomes an integral component of all education reform policy.

Questions for Further Research

This study has attempted to determine the level of implementation of the Mathematics Curriculum Framework at the district level. In the process, additional questions for further research have been identified. They include

- How are districts that have aligned their curriculum to the framework determining and evaluating their actual use in the schools?
- How are districts determining what the current teaching practices are? How are they determining if the practices are meeting the needs of the students? How are districts deciding what new pedagogical approaches should be added to the teaching repertoires of educators?
- Exactly what textbooks and instructional materials have been adopted in districts? How are districts selecting these materials? How are districts evaluating their effectiveness?
- How are districts using the professional development funds that are not being spent on professional development? Why are districts not spending the minimum amount required by law?

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Figures and Tables

Figure 1: Alignment of teachers in sample districts who received three essential documents.

Figure 2: Percentage of districts that have aligned local curriculum with the Mathematics Curriculum Framework.

Figure 3: Percentage of middle and high schools with new mathematics textbook adoptions.

Figure 4: Percentage of actual expenditures in FY98 and FY99 and budgeted expenditures for FY00 for professional development in all districts and in study sample districts.

Figure 5: Percentage of districts offering professional development in five key areas needed for the systemic implementation of the Mathematics Curriculum Framework.

Figure 6: Analysis of Board of Education decisions and/or discussions of the five elements of education reform: Curriculum Frameworks, Assessment, School and District Accountability, Professional Development, and Communicating with the Field.

Figure 7: Analysis of the content of the Commissioner's Mailings from June 1995 through June 2000 related to the five elements of education reform: Curriculum Frameworks, Assessment, School and District Accountability, Professional Development, and Communicating with the Field.

Figure 8: Total MDOE Professional Development from 1995-2000 by region.

Figure 9: Percentage of Student Population by region.

Table 1: Statewide and sample districts failure rates on the 1999 administration of the Grade 8 and Grade 10 MCAS Mathematics test.

Table 2: Analysis of district professional development plans on file with MDOE from 1994-2000.

Table 3: Regional breakdown of MDOE professional development activities offered from 1995 through 2000 in education reform, mathematics and science, and mathematics only.

Table 4: Annual distribution of Mathematics Only MDOE Professional Development since the adoption of the 1995 Mathematics Curriculum Framework.

End Notes

[1] The new draft of the Mathematics Curriculum Framework was approved by the Board of Education in July 2000 This framework will not be used to create MCAS questions for the 2001 administration of the test.

[2] According to the MDOE, "PALMS is a cooperative initiative of the Massachusetts Department of Education, the National Science Foundation, the Noyce Foundation, and the United States Department of Education."

[3] The Massachusetts Teachers Association Center for Educational Quality and Professional Development in conjunction with the Massachusetts Association of School Superintendents provided training through a series of six two-day regional conferences during April and May 2000 to 122 school districts (37% of all districts) across the state on developing a district professional development plan. Districts sent teams that included the superintendent, a principal, the local association/union president, and two teachers. It was apparent that districts had not written professional development plans to the full extent needed because the leaders did not know how to do this; many cited the failure of MDOE staff to provide the information and expertise necessary to develop such plans.

[4] It should be noted that the MDOE indicates on its web site that 70 Coordinated Program Reviews were conducted in FY00; 66 of which were in public school districts and 4 in charter schools. However, when asked to produce these documents in discovery, only 12 CPR reports were produced by the MDOE. (www.doe.mass.edu/pq/CPRYF00.html)

[5] The responses to Walt Haney's two questions presents a overarching scheme for what it takes to turn schools into learning organizations focused on higher order thinking skills. The time frame of 7-10 years seems to be generally accepted. What is significant is that his questions relate to a typical urban school – those at the very core of the equity initiative behind the Education Reform Act of 1993. *Imagine a very large school system that has been focusing on basic skills instruction for some years. The focus has been spurred in part by a high stakes test of basic skills. It is assumed that 80-90% of teachers have been covering the basic skills in their instruction.*

Key to Bullets in this Study

- Itemized topics
- ✓ Findings
- ◆ Recommendations

For the purposes of this study, a "school district" includes only operating districts: this does include regional vocational technical and regional school districts; this does not include Commonwealth Charter Schools.

Appendix A
Data Sources

The study utilizes quantitative and qualitative data from government sources, school districts, and local teachers' associations.

Quantitative sources:

- FY98 and FY99 Actual Professional Development Expenditures as reported to the Department of Education on the End-of-Year Pupil and Financial Report;
- FY00 Budgeted Professional Development Expenditures as reported to the Department of Education;
- School and District 1999 MCAS results from the Department of Education; and
- School and District 1998 MCAS results from the Department of Education.

Qualitative sources:

- Board in Brief notes posted on the Department of Education web site;
- Commissioner's Mailings posted on the Department of Education web site;
- Goals 2000 Five Year Master Plan from the Department of Education;
- 1995 and 1998 State Professional Development Plans;
- Summative Reports from the eighteen school district audits conducted by the Massachusetts Education Management Accountability Board;
- District Professional Development Plans on file with the Department of Education;
- Surveys to local teachers' associations focusing on actual district implementation of the mathematics framework; and
- Partnerships Advancing the Learning of Mathematics, Science and Technology (PALMS) reports posted on the Department of Education web site and provided by MDOE staff.

As part of the "discovery" of a lawsuit pending against the Massachusetts Board of Education, the Massachusetts Teachers Association is in receipt of a wide array of Department of Education documents that are directly related to the professional development of teachers. These include:

- All district professional development plans on file with the MDOE;
- All Coordinated Program Review reports conducted by the MDOE; and
- All research reports conducted by the MDOE related to the implementation of education reform.

Appendix B

Board of Education Notes Decisions and Commissioner's Mailings Notices related to Curriculum Frameworks (CF), Assessment (TEST), School and District Accountability (SDA), Professional Development (PD), and Communication with Field (Field)

Year	Education Reform Element	Board of Education	Commissioner's Mailing
1995			
	Curriculum Frameworks	May 25, October 26, December 12	
	Assessment		
	School and District Accountability		June 16, September 20,
	Professional Development	June 20, July 24	August 16, October 4
	Informing the Field	July 24	December 18
1996			
	Curriculum Frameworks		February 16, July 15, December 16
Jan. 25	Assessment	January 25, August 15, September 24, October 24,	February 16, September 17, October 4
	School and District Accountability		
	Professional Development	March 22	February 16, April 18, May 17, September 3, September 17
	Informing the Field		January 4, February 1, September 3, November 4
1997			
	Curriculum Frameworks	January 17	January 30, March 18, April 3, June 4, October 3
	Assessment	February 13, May 14	August 15, October 3, November 12
	School and District Accountability		March 13, August 27
	Professional Development		January 30, January 31, March 18, April 23, June 4, September 17, December 2
	Informing the Field		April 3, April 23, May 7, May 20, June 4, August 18, October 3, October 22, November 12
1998			
	Curriculum Frameworks	February 10, February 26, May 15, September 17, November 13, December 16	February 27, September 1
	Assessment	January 12, June 25, September 17, November 13, December 16	February 12, April 2, April 16, May 5, June 8, October 5, October 26, November 16
	School and District Accountability	October 15, November 13, December 16	August 17

Year	Education Reform Element	Board of Education	Commissioner's Mailing
	Professional Development	September 17	January 7, February 12, February 27, May 21, July 10, August 17, September 22, October 5, December 18
	Informing the Field	December 16	January 7, February 12, June 8, August 17, October 5, October 26, November 16, December 18
1999			
	Curriculum Frameworks		March 2, March 19, April 1, August 17, September 17, November 1, November 16
	Assessment	January 28	February 3, March 19, April 1, June 2, July 8, August 17, September 1, September 17, October 1, October 18, November 1, November 16, December 3
	School and District Accountability		April 1, May 7, July 8, August 17, October 1, December 27
	Professional Development	May 27, July 1, October 27	February 3
	Informing the Field		July 8, August 17, September 1, October 18, November 1, November 16, December 3, December 27
2000			
	Curriculum Frameworks		January 19, February 22, March 6
	Assessment	January 25, February 23	January 19, February 7, February 22, March 21
	School and District Accountability	January 25, February 23, March 28	January 19
	Professional Development		February 22, March 6
	Informing the Field		January 19, February 7, February 22, March 6, March 21

Appendix C

MDOE Education Reform Professional Development 1996-2000

Date	Type	Location	Audience	Capacity
March 6, April, 3, & May 1, 1996	Art of Designing Effective Professional Development Plans (3 sessions)	Auburn	Admin. Team	11 districts
March 6 , 26 & April 23, 1996	Leadership: A Key Ingredient in School Development (3 sessions)	Wakefield	Admin. Team	11 districts
March 13, April 10, & May 15, 1996	Art of Designing Effective Professional Development Plans (3 sessions)	Framingham	Admin. Team	11 districts
April 12, 26, & May 10, 1996	Educational Technology: What District Leadership Needs to Know (3 sessions)	Marlboro	Admin. Team	11 districts
April 24 & May 16, 1996	Decisions... Practical Strategies that Work (2 sessions)	Braintree	Admin. Team	11 districts
April 29 and May 20, 1996	Student Assessment in the Classroom and on the State Test (2 sessions)	Auburn	Admin. Team	11 districts
April 30 and May 21, 1996	Student Assessment in the Classroom and on the State Test (2 sessions)	Andover	Admin. Team	11 districts
May 8, 1996	High Expectations Conference: Institute I	Northampton	Educators	@100
May 13, 1996	High Expectations Conference: Institute II	Randolph	Educators	@200
May 22, 1996	High Expectations Conference: Institute III	Worcester	Educators	@100
October 8, 1996	Education Reform: Update on Statewide Technology Initiatives	Springfield	Admin. Team	@ 25 districts
October 10, 1996	Education Reform: Update on Statewide Technology Initiatives	Worcester	Admin. Team	@ 25 districts
October 15, 1996	Education Reform Study Group Conveners' Meeting	Tyngsboro	Conveners	
October 16 & December 3, 1996	School Improvement Planning Conference (2 sessions)	Springfield	School Team	@ 25 schools
October 17, 1996	Education Reform: Update on Statewide Technology Initiatives	Mansfield	Admin. Team	@ 25 districts
October 22, 1996	Education Reform Study Group Conveners Meeting	Worcester	Conveners	
October 23 & December 5, 1996	School Improvement Planning Conference (2 sessions)	Mansfield	School Team	@ 25 schools
October 24, 1996	Education Reform Study Group Conveners Meeting	Springfield	Conveners	
October 29, 1996	Education Reform Study Group	Hyannis	Conveners	

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Date	Type	Location	Audience	Capacity
October 30 & December 10, 1996	School Improvement Planning Conference (2 sessions)	Sturbridge	School Team	@ 25 schools
November 13 & 14, 1996	Education Reform: Teacher Fellowship Program (2 sessions)	Marlboro	District Team	20 Districts
January 30 & March 12, 1997	Education Reform: Teacher Fellowship Program – East (2 sessions)	Waltham	District Team	
February 5, March 6, & May 6, 1997	Education Reform: Teacher Fellowship Program – West (3 sessions)	So. Hadley	District Team	
March 11, 1997	Curriculum Frameworks and Student Assessment - March Forums	Bridgewater	District Team	@ 62 districts
March 19, 1997	Curriculum Frameworks and Student Assessment - March Forums	Lowell	District Team	@ 62 districts
March 20, 1997	Curriculum Frameworks and Student Assessment - March Forums	Westfield	District Team	@ 62 districts
March 26, 1997	Curriculum Frameworks and Student Assessment - March Forums	Worcester	District Team	@ 62 districts
May 13, 1997	Education Reform Study Group Conveners Meeting	Worcester	Conveners	Cancelled
May 14, 1997	Education Reform Study Group Conveners Meeting	Tyngsboro	Conveners	Cancelled
March 13, 1998	MCAS Regional Workshop: Preparing to Teach in a Standards-based (1/2 day)(Environment	Greater Boston	Teachers	50
March 13, 1998	MCAS Regional Workshop: Preparing for MCAS	Greater Boston	Administrators	50
March 16, 1998	MCAS Regional Workshop: Preparing for MCAS	Pittsfield	Administrators	50
March 16, 1998	MCAS Regional Workshop: Preparing to Teach in a Standards-based Environment	Pittsfield	Teachers	50
March 17, 1998	MCAS Regional Workshop: Preparing to Teach in a Standards-based Environment	Amherst	Teachers	50
March 17, 1998	MCAS Regional Workshop: Preparing for MCAS	Amherst	Administrators	50
March 24, 1998	MCAS Regional Workshop: Preparing for MCAS	Lowell-Lawrence	Administrators	50
March 24, 1998	MCAS Regional Workshop: Preparing to Teach in a Standards-based Environment	Lowell-Lawrence	Teachers	50

Date	Type	Location	Audience	Capacity
March 26, 1998	MCAS Regional Workshop: Preparing for MCAS	Worcester	Administrators	50
March 26, 1998	MCAS Regional Workshop: Preparing to Teach in a Standards-based Environment	Worcester	Teachers	50
March 30, 1998	MCAS Regional Workshop: Preparing to Teach in a Standards-based Environment	New Bedford	Teachers	50
March 30, 1998	MCAS Regional Workshop: Preparing for MCAS	New Bedford	Administrators	50
August 10 & 11, 1998	English Language Arts Standards Panels: Grade 4, 8 and 10	Danvers	PK-12 educators	3 groups of 20
August 11 & 12, 1998	Mathematics Standards Panels: Grade 4, 8 and 10	Danvers	PK-12 educators	3 groups of 20
August 12 & 13, 1998	Science & Technology Standards Panels: Grade 4, 8 and 10	Danvers	PK-12 educators	3 groups of 20
March 23, 2000	Recertification Workshop (9:00 – 11:30)	Marlboro	Administrators	400 educators

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Appendix D

MDOE Mathematics and Science Professional Development 1993-2000

Year	Sites	No.	Aud.	MS/MO	Days	Topics	Locations
1993	3	60 districts	PK-8	MO	10	Workshops in Math and Science	Bridgewater, Marlboro, So. Hadley
						total of 120 teachers in math and science	
1994	5	100 dist.	PK-12	MO	10	Beyond Tomorrow	Bridge, Wor, Boston, So. Hadley, Andover
						total of 300 teachers in math and science	
1995	9	90 districts	PK-12	MS	5	Systemic Implementation of Ed Reform	Milton-2, Tyngsboro-2, Ashland-2, Mansfield, Springfield-2
						total of 540 teachers in math and science	
1996	23		Gr.9-12	MO	10	Calculus Reform & Technology	Cambridge, Harvard
			Gr. 6-12	MS	10	Learning Math and Science Together	Franklin, Brown Univ.
			Gr. 9-12	MO	15	Discrete Mathematics	Newton, Boston College
			Gr. 6-12	MO	10	Connected Geometry	Newton, EDC
			Gr. 6-9	MS	5	Physical Science & Math Content Ins.	Peabody, Salem State
			K-12	MO	10	SummerMath for Teachers	So. Hadley, Mt. Holyoke
			Gr. 3-5	MO	5	Teaching Investigations in Number, Data and Space	Dorchester, TERC
			Gr. 9-12	MO	5	Introduction to Interactive Math Programs	Fitchburg State, Bridgewater State
			K-12	MO	5	Mathematics as Problem Solving	Worcester, Fitchburg State
				SO		12 institutes related to science only	
						365 MS/ 280 math only	
1997	24		K-12	MO	10	Math for Elementary, Middle and High School	Westfield, WSC
			K-12	MO	5	k-12 Mathematics Forum	Pittsfield and Northampton
			Gr. 9-12	MO	5	Calculus and the Internet	Cambridge, Harvard
			Gr. 6-8	MS	5	Mid. Sch. Connections for Math, Sci & the CF	Peabody, SSC
			Gr. 6-8	MS	5	IMaST	Bridgewater State
			Gr. 6-12	MO	5	Connected Geometry	Newton, EDC

Year	Sites	No.	Aud.	MS/MO	Days	Topics	Locations
			K-8	MS	10	Discovering Science & Math in Everyday Places	Outer Cape, southeast, metro, northeast, Lowell, North Berkshires, Springfield, Worcester
			Gr. 9-12	MO	10	Technology in Mathematics Instruction	Worcester State
			Gr. 6-12	MO	5	Mathematics as Problem Solving	Worcester
			Gr. 9-12	MO	5	Interactive Mathematics	Cape Cod, Northampton
			K-12	MO	10	SummerMath for Teachers	So. Hadley
			K-8	MS	8	Science and Math in the Schoolyard	No. Attleboro
			Gr. 9-12	MO	6	Math Connections	Middletown, CT
						11 institutes related to science only	
						1053 MS/346 Math only	
1998	57					All Content Areas	
			K-12	MO	10	SummerMath for Teachers	So. Hadley
			Gr. 5-12	MS	5	Science and Math Around Real Transitions	Amherst, Greenfield
			K-5	MO	10	Learning and Teaching Mathematics	Boston, Wheelock
			k-8	MO	5	Strategies for Using Mathematics	Worcester
			Gr. 7-12	MO	5	Connected Geometry	Newton, EDC
			Gr. 7-12	MO	5	Mathematics as Problem Solving	Worcester
			Gr. 7-12	MO	8	Focus on Math: emphasis on middle/secondary	Newton, Boston College
						321MS/246 Math only	
1999	49					All Content Areas	
			K-6	MO	9	Investigating Mathematics	Boston and Northborough
			Gr. 2& 5	MO	8	Summer Investigations	Boston
			K-8	MO	10	Creating a Math Standards-based learning environment	Framingham
			K-8	MO	12	Achieving Mathematical Power	Acton
			Gr. 6-8	MO	10	Measuring Understanding	Sandwich
			Gr. 6-8	MS	10	Integrating Standards-based & Inquiry-based Curr. In MS	Wareham
						212 MS/182 Math only	
2000	60					All Content Areas/www.doe.mass.edu/palms/PLM_news	
			Gr. 6-8	MO	8	Explorations in SB and IB Geometry Topics in MS	Salem
			Gr. 6-12	MO	10	Maritime Mathematics	New Bedford, Bridgewater

Year	Sites	No.	Aud.	MS/MO	Days	Topics	Locations
			Gr. 6-8	MO	10	Middle School Mathematics	Haverhill
			Gr. 6-9	MO	5	Connected Mathematics Program	Attleboro
			Gr. K-6	MO	5	Developing Mathematical Ideas	Weston
			Gr. K-5	MO	5	Everyday Mathematics Program	Avon, CT
			Gr. K-5	MO	5	Everyday Mathematics Program	Shrewsbury
			Gr. 6-9	MO	5	Connected Mathematics Program	Shrewsbury
			Gr. 6-9	MO	5	Middle School Content & Graphing Calculators	Shrewsbury
			Gr. 6-12	MS	5	Navigating the Math and Science Standards for Middle through High School	Peabody
			Gr. K-5	MS	5	Standards-based Curriculum - Elementary	Chelmsford
			Gr. K-12	MS	5	Education Technology Specialist	Chelmsford
			Gr. 6-12	MS	10	Linking Math and Technology Engineering	Amherst
			Gr. K-5	MO	5	Investigating Numbers, Data and Space	Amherst
						352 MS/252 MO	

Appendix E
Survey about District Mathematics Program

Teacher-leaders were asked to complete this survey by reporting what had happened to date (June 1993 – April 2000) in their district with regard to the items listed below. Teachers association executive boards include teachers from all school buildings in the district.

Directions: The Local President is asked to complete this survey with her/his executive board and return it to the MTA Center for Educational Quality and Professional Development (617-742-7950).

1. Has the district provide each mathematics teacher – and each teacher who teaches a minimum of one mathematics course – with a copy of the Massachusetts Curriculum Framework in Mathematics?
   _____ No _____ Yes When was it provided: _____

2. Is your local curriculum aligned with the Mathematics Curriculum Frameworks at each of the grades below? If so, when did this alignment occur?

✓	Kindergarten	_____ No	_____ Yes	When: _____
✓	Grade 1	_____ No	_____ Yes	When: _____
✓	Grade 2	_____ No	_____ Yes	When: _____
✓	Grade 3	_____ No	_____ Yes	When: _____
✓	Grade 4	_____ No	_____ Yes	When: _____
✓	Grade 5	_____ No	_____ Yes	When: _____
✓	Grade 6	_____ No	_____ Yes	When: _____
✓	Grade 7	_____ No	_____ Yes	When: _____
✓	Grade 8	_____ No	_____ Yes	When: _____
✓	Grade 9	_____ No	_____ Yes	When: _____
✓	Grade 10	_____ No	_____ Yes	When: _____
✓	Grade 11	_____ No	_____ Yes	When: _____
✓	Grade 12	_____ No	_____ Yes	When: _____

3. Has each mathematics teacher – and each teacher who teaches a minimum of one mathematics class – have a copy of the district's mathematics curriculum (with or without alignment)?
   _____ No _____ Yes When was it provided: _____

4. Was a copy of the mathematics "bridge" document published by the Massachusetts Department of Education provided to each mathematics teacher – and each teacher who teaches a minimum of one mathematics class – in the district?
   _____ No _____ Yes When was it provided: _____

5. Has the district provided Professional Development related specifically to the Mathematics Curriculum Frameworks for all teachers responsible for the instruction of Mathematics? If yes, please describe the PD activity.
   _____ No _____ Yes When did the activity occur: _____
   How many PDPs were awarded? _____
   Describe the activity:

6. Was there systemic Professional Development for all teachers in standards-based curriculum, instruction, and assessment?
_____ No _____ Yes When did the activity occur: _____
How many PDPs were awarded? _____
Describe the activity:

7. Has the district provided Professional Development for all teachers in components of the MCAS test?
_____ No _____ Yes When did the activity occur: _____
How many PDPs were awarded? _____
Describe the activity:

8. Has the district provided Professional Development in understanding the meaning of MCAS scores in Mathematics?
_____ No _____ Yes When did the activity occur: _____
How many PDPs were awarded? _____
Describe the activity:

9. Has the district provided Professional Development in developing remediation plans for students who did not succeed on the MCAS mathematics test?
_____ No _____ Yes When did the activity occur: _____
How many PDPs were awarded? _____
Describe the activity:

10. Has the district purchased new textbooks and materials to use in standards-based classrooms?
_____ No _____ Yes When did the purchase occur: _____
Was there accompanying Professional Development?
_____ No _____ Yes When did the activity occur: _____
How many PDPs were awarded? _____
Describe the activity:

Appendix F
District Professional Development Plans

District _____
Date of Plan(s) _____

AUTHORSHIP (Check)

_____ Authored by District Administration?
_____ Authored by Joint Entity?
_____ Authorship Unknown

GOALS

_____ Contains mission statement?
_____ Contains explicit state goals?
_____ Contains explicit district goals?
_____ Contains explicit building goals?
_____ Encourages participatory decision making?

ACTIVITIES

_____ Contains the program catalogue, calendar, listing or directly references district PD offerings?
_____ Describes process for accessing PD?
_____ Is there a mechanism for ongoing evaluation of the plan and program?
_____ Describes **how** the plan and program address state goals?
_____ Describes **how** the plan and program address district goals?
_____ Describes **how** the plan and program support recertification and IPDP?
_____ Do they include specific & sufficient content?
_____ Do they address all professional staff (as opposed to only teaching staff)?

BUDGET

_____ Describes relationship to district budget or sets forth PD budget?

OTHER

_____ Any evidence of being based on educational needs assessment?
_____ Any evidence on being based on staff needs assessment?
_____ Evidence of satisfying the no cost option?

NOTES

Appendix G
Massachusetts Department of Education
Guidelines for Student and Financial Reporting

2350 Professional Development for teachers, support staff and school councils funds may be expended on the following:

- Salaries, full-time directors of professional development or the prorated share of the salaries of instructional supervisors, teachers, librarians, audio-visual specialists, guidance counselors, school psychologists or educational television specialists who spend one-half or more of their time providing professional development
- Salaries, teachers, librarians, audio-visual specialists, guidance counselors, school psychologists or educational television specialists who participate in in-service days beyond the contractual number of days of instruction where at least fifty percent of the day is devoted to professional development
- Salaries or the prorated share of salaries, clerical and support staff working on professional development activities
- Salaries, staff substituting for teachers who are participating in professional development activities
- Stipends, professional staff providing or receiving professional development services beyond the regular length of the school day
- Supplies and materials
- Contracted Services
- Dues and subscriptions
- Travel expenses for staff
- Tuition and/or conference fees

Appendix H
District PD Plans on File with DOE: 1994-2000

	District	PALMS	Per Pupil Professional Development Expenditures			1999 MCAS Mathematics Failure Rate		District Professional Development Plans on File					
			FY98 $75	FY99 $100	FY00 $125	Gr. 8	Gr. 10	94-5	95-6	96-7	97-8	98-9	99-0
1.	**ABINGTON #**	X	80	101	100	*23*	*49*					I	
2.	ACTON		92	95	0	-	-					I	
3.	ACUSHNET	X	72	91	121	*29*	-					I	
4.	AGAWAM *	X	88	101	100	-	*54*					I	
5.	AMESBURY		76	104	126	*32*	*45*				I		
6.	AMHERST ##	X	116	153	136	*30*	-						
7.	ANDOVER		87	101	125	-	*12*						
8.	**ARLINGTON**	X	86	141	143	*13*	*34*						
9.	ASHLAND		59	82	104	*22*	*29*						
10.	**ATTLEBORO**	X	106	127	130	*27*	*54*		I				
11.	**AUBURN ***		88	145	161	*33*	*38*					C	
12.	AVON	X	95	105	100	*25*	*72*					I	
13.	**AYER**		148	153	0	*51*	*42*					I	
14.	**BARNSTABLE #**	X	71	105	100	*45*	*40*				I		
15.	**BEDFORD ##**		142	161	155	*32*	*30*					C	
16.	BELCHERTOWN	X	55	104	100	*13*	*32*						I
17.	BELLINGHAM		86	103	125	*25*	*37*					I	C
18.	BELMONT #	X	85	111	114	*40*	*20*				I	I	
19.	BERKLEY		63	86	87	*15*	-						
20.	BERLIN		32	40	73	-	-						
21.	BEVERLY		82	103	100	*25*	*50*					I	
22.	BILLERICA		60	40	61	*39*	*46*				I	I	
23.	BOSTON	X	156	166	144	*59*	*63*					I	
24.	**BOURNE**		72	77	81	*43*	*39*						
25.	BOXBOROUGH		25	105	108	-	-						
26.	BOXFORD		103	104	124	-	-				I		
27.	BOYLSTON		31	31	31	-	-						
28.	BRAINTREE *	X	55	85	92	*24*	*40*					C	
29.	BREWSTER		43	58	72	-	-						
30.	BRIMFIELD		96	96	101	-	-					I	

Key

Boldface	Sample Survey Districts
*	EMAB audited districts
#	MDOE Coordinated Program Review provided to MTA through lawsuit discovery
##	MDOE reported CPR audit done in FY00; no report provided to MTA through lawsuit discovery
I	Incomplete district professional development plan
C	Complete district professional development plan

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	District	PALMS	Per Pupil Professional Development Expenditures			1999 MCAS Mathematics Failure Rate		District Professional Development Plans on File					
			FY98 $75	FY99 $100	FY00 $125	Gr. 8	Gr. 10	94-5	95-6	96-7	97-8	98-9	99-0
31.	**BROCKTON ***	X	30	73	118	*66*	*69*				I	I	
32.	BROOKFIELD		106	94	102	-	-						
33.	BROOKLINE		100	105	102	*14*	*23*					I	
34.	BURLINGTON		77	83	84	*27*	*47*					I	
35.	CAMBRIDGE *	X	97	143	158	*40*	*58*						
36.	CANTON #	X	82	108	93		*37*					I	
37.	CARLISLE		82	139	156		-						
38.	**CARVER**		91	103	126	*33*	*37*					I	
39.	CHATHAM		99	110	125	*19*	*40*						
40.	CHELMSFORD		79	85	87	*21*	*41*						
41.	CHELSEA		77	100	125	*63*	*60*					I	
42.	**CHICOPEE**		91	147	156	*60*	*66*					I	
43.	CLARKSBURG		72	111	123	*14*	-						
44.	CLINTON ##		100	87	89	*27*	*53*						
45.	COHASSET		90	117	113	*11*	*15*					I	
46.	CONCORD		99	179	165	*10*	-						
47.	CONWAY		110	98	105	-	-						
48.	DANVERS		134	139	145	*27*	*52*				I		
49.	**DARTMOUTH**	X	87	103	102	*34*	*49*				I		
50.	DEDHAM		17	59	53	*38*	*37*					I	
51.	DEERFIELD		102	113	124	-	-						
52.	DOUGLAS ##		49	34	49	*47*	*47*					I	
53.	DOVER		28	39	72	-	-						
54.	DRACUT		79	104	100	*42*	*42*						
55.	DUXBURY		73	122	120	*12*	*25*					I	
56.	EAST BRIDGEWATER	X	82	105	103	*39*	*49*					I	
57.	EASTHAM		43	64	91	-	-						
58.	EASTHAMPTON	X	76	107	117	*31*	*48*						
59.	EAST LONGMEADOW * ##		75	108	105	*32*	*44*					I	
60.	EASTON	X	62	85	90	*20*	*43*					I	
61.	EDGARTOWN		90	81	81	*28*	-						
62.	ERVING	X	131	99	103	-	-					I	
63.	ESSEX		77	175	176	*40*	-						
64.	**EVERETT ***		49	51	0	*59*	*54*					I	
65.	FAIRHAVEN #	X	51	59	70	*44*	*59*					I	
66.	FALL RIVER	X	82	105	127	*65*	*70*				I		
67.	FALMOUTH	X	74	86	99	*42*	*44*					I	
68.	**FITCHBURG**		21	18	18	*63*	*57*					I	
69.	FLORIDA		121	137	116	*38*	-						
70.	FOXBOROUGH	x	103	113	121	*22*	*34*						I
71.	FRAMINGHAM		110	68	76	*40*	*38*					I	
72.	FRANKLIN		88	110	113	*23*	*28*					I	

District		PALMS	Per Pupil Professional Development Expenditures			1999 MCAS Mathematics Failure Rate		District Professional Development Plans on File					
			FY98 $75	FY99 $100	FY00 $125	Gr. 8	Gr. 10	94-5	95-6	96-7	97-8	98-9	99-0
73.	FREETOWN		89	95	97	-	-						
74.	GARDNER *		52	121	100	*43*	*39*					I	
75.	**GEORGETOWN**		78	101	100	*30*	*24*					I	
76.	**GLOUCESTER**		93	162	155	*47*	*52*					I	
77.	GRAFTON		96	146	148	*25*	*39*					I	
78.	GRANBY		91	97	132	*26*	*61*					I	
79.	GRANVILLE ##		48	42	42	*22*	-					I	
80.	GREENFIELD	X	121	134	141	*38*	*51*						
81.	HADLEY	X	51	112	0	*19*	*17*						
82.	HALIFAX		8	27	32	-	-						
83.	HANCOCK		14	25	25	-	-						
84.	HANOVER		17	21	0	*20*	*28*					I	
85.	HARVARD		55	88	100	*8*	*14*						
86.	HARWICH	X	75	100	106	*27*	*46*					I	
87.	HATFIELD	X	8	15	0	*23*	*26*					I	
88.	**HAVERHILL**		42	51	83	*56*	*58*						
89.	**HINGHAM ##**		81	121	107	*17*	*26*				I		
90.	HOLBROOK ##	X	77	119	122	*37*	*60*						I
91.	HOLLAND		113	27	53	-	-						
92.	HOLLISTON		104	105	103	*19*	*19*						
93.	**HOLYOKE #**	X	19	100	125	*77*	*78*						
94.	HOPEDALE		51	56	42	*28*	*31*					I	
95.	HOPKINTON		95	103	102	*15*	*41*					I	
96.	HUDSON		111	032	182	*42*	*39*				I	I	
97.	**HULL**	X	100	108	111	*42*	*51*					I	
98.	**IPSWICH**		91	109	86	*20*	*32*					I	
99.	KINGSTON		16	15	24	-	-						
100.	LAKEVILLE		87	90	127	-	-						
101.	LANESBOROUGH ##		58	38	45	-	-						
102.	LAWRENCE #		69	88	133	*76*	*74*						I
103.	**LEE ##**	X	0	4	0	*33*	*38*					I	
104.	LEICESTER		44	30	34	*27*	*44*					I	
105.	LENOX		108	111	148	*13*	*21*					I	
106.	LEOMINSTER		84	122	134	*41*	*58*						
107.	LEVERETT		136	158	170	-	-						
108.	**LEXINGTON ***		67	104	0	*9*	*22*					I	
109.	LINCOLN		96	97	88	*29*	-					I	
110.	LITTLETON		171	156	153	*24*	*30*					I	
111.	LONGMEADOW		143	150	147	*13*	*30*					I	
112.	LOWELL * ##		70	85	105	*65*	*55*					C	
113.	LUDLOW	X	82	99	102	*29*	*45*					I	
114.	**LUNENBURG**		76	101	101	*26*	*40*					I	
115.	LYNN		95	107	123	*71*	*68*						
116.	LYNNFIELD		93	112	125	*28*	*32*					I	

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District		PALMS	Per Pupil Professional Development Expenditures			1999 MCAS Mathematics Failure Rate		District Professional Development Plans on File					
			FY98 $75	FY99 $100	FY00 $125	Gr. 8	Gr. 10	94-5	95-6	96-7	97-8	98-9	99-0
117.	MALDEN *	X	76	84	98	*50*	*57*					I	
118.	MANCHESTER #		129	133	0	*14*	*27*					I	
119.	MANSFIELD	X	39	78	88	*30*	*39*					I	
120.	MARBLEHEAD ##		103	130	174	*17*	*26*				I		
121.	MARION		137	141	268	-	-						
122.	MARLBOROUGH		87	87	103	*42*	*37*					I	
123.	MARSHFIELD ##	X	44	100	95	*27*	*36*					I	
124.	MASHPEE	X	78	53	53	*47*	*60*						
125.	MATTAPOISETT	X	97	102	134	-	-						
126.	MAYNARD ##		58	168	84	*40*	*49*					I	
127.	MEDFIELD		29	70	0	*11*	*19*						
128.	MEDFORD	x	93	105	109	*44*	*58*					I	
129.	MEDWAY		95	123	110	*9*	*26*					I	
130.	MELROSE		75	116	100	*22*	*44*					I	
131.	METHUEN		103	122	96	*32*	*47*						
132.	MIDDLEBORO ##	X	67	72	103	*47*	*58*					I	
133.	MIDDLETON		106	111	0	-	-				I		
134.	MILFORD		89	101	105	*34*	*33*					I	
135.	MILLBURY		96	101	104	*43*	*41*				I		
136.	MILLIS		85	103	131	*39*	*34*						
137.	MILTON *	X	21	22	32	*30*	*35*					C	
138.	**MONSON**	X	126	135	148	*42*	*40*					I	
139.	NAHANT ##		24	41	46	-	-					I	
140.	**NANTUCKET**	X	160	50	45	*22*	*49*						
141.	**NATICK**	X	71	65	66	*29*	*44*					I	
142.	**NEEDHAM**		64	95	100	*14*	*23*				I	I	
143.	NEW BEDFORD *	X	72	92	125	*68*	*60*						
144.	**NEWBURYPORT ##**		124	146	160	*12*	*42*				I		I
145.	NEWTON		104	156	139	*12*	*24*				C		
146.	NORFOLK	X	45	38	112	-	-						I
147.	NORTH ADAMS	X	57	73	126	*58*	*58*				I	I	
148.	NORTHAMPTON		51	60	70	*28*	*37*					I	
149.	NORTH ANDOVER		102	106	118	*21*	*29*					I	
150.	NORTH ATTLEBOROUGH *	X	75	105	100	*34*	*40*				I		
151.	NORTHBOROUGH		86	36	37	*11*	-						
152.	NORTHBRIDGE		98	115	0	*40*	*53*				I		
153.	NORTH BROOKFIELD		76	103	100	*36*	*57*		I				
154.	**NORTH READING ***		35	22	49	*15*	*35*		I				
155.	NORTON ##	X	97	97	97	*26*	*33*						
156.	NORWELL		81	114	100	*17*	*34*						
157.	NORWOOD		89	103	125	*25*	*39*				I	I	
158.	OAK BLUFFS		97	94	94	*36*	-						

District		PALMS	Per Pupil Professional Development Expenditures			1999 MCAS Mathematics Failure Rate		District Professional Development Plans on File					
			FY98 $75	FY99 $100	FY00 $125	Gr. 8	Gr. 10	94-5	95-6	96-7	97-8	98-9	99-0
159.	ORANGE	X	144	145	163	-	-					I	
160.	ORLEANS		43	61	120	-	-						
161.	OXFORD ##		84	109	97	*58*	*64*				I		
162.	PALMER	X	51	59	94	*63*	*47*						
163.	PEABODY		21	38	60	*27*	*53*				I	I	I
164.	PELHAM		12	50	45	-	-						
165.	PEMBROKE		57	64	65	-	-						
166.	PETERSHAM ##		186	89	124	-	-						
167.	PITTSFIELD ##	X	79	106	117	*51*	*46*					I	
168.	PLAINVILLE ##	X	84	110	100	-	-					I	
169.	PLYMOUTH ##	X	76	82	0	*34*	*46*				I	I	
170.	PLYMPTON		46	41	77	-	-						
171.	PROVINCETOWN		156	108	127	*21*	*26*					C	C
172.	QUINCY	X	77	101	109	*34*	*54*					I	
173.	RANDOLPH	X	84	75	94	*48*	*66*					I	
174.	READING		108	158	169	*14*	*22*						
175.	REVERE	X	67	101	119	*60*	*63*					I	
176.	RICHMOND		24	38	0	*15*	-						
177.	ROCHESTER		98	121	110	-	-						
178.	**ROCKLAND**	X	79	103	100	*45*	*46*					I	
179.	ROCKPORT		56	88	0	*34*	*40*					I	
180.	ROWE		69	141	434	-	-						
181.	SALEM *		84	118	118	*48*	*54*				I		
182.	**SANDWICH**	X	39	48	52	*16*	*25*					I	
183.	**SAUGUS**		71	76	84	*42*	*38*					I	
184.	SAVOY		65	90	78	-	-						
185.	SCITUATE		92	103	87	*22*	*37*					I	
186.	SEEKONK ##	X	61	83	81	*32*	*49*						
187.	**SHARON**		32	30	54	*17*	*21*					I	
188.	SHERBORN		78	71	99	-	-						
189.	SHIRLEY		75	128	100	*24*	-					C	
190.	SHREWSBURY		117	149	0	*23*	*26*				I	I	
191.	SHUTESBURY		118	115	161	-	-						
192.	**SOMERSET**		66	78	100	*47*	*54*					I	
193.	SOMERVILLE	X	127	207	202	*44*	*68*					I	
194.	SOUTHAMPTON		10	115	0	-	-						
195.	SOUTHBOROUGH		108	42	45	*8*	-						
196.	SOUTHBRIDGE		105	91	91	*52*	*49*					I	
197.	SOUTH HADLEY ##	X	48	33	91	*38*	*37*					I	
198.	SPRINGFIELD		154	167	167	*74*	*67*					I	
199.	STONEHAM ##	X	123	133	131	*17*	*41*					I	
200.	STOUGHTON		98	116	125	*23*	*49*					I	
201.	STURBRIDGE		120	89	98	-	-						
202.	SUDBURY ##		116	78	88	*10*	-						

District		PALMS	Per Pupil Professional Development Expenditures			1999 MCAS Mathematics Failure Rate		District Professional Development Plans on File					
			FY98 $75	FY99 $100	FY00 $125	Gr. 8	Gr. 10	94-5	95-6	96-7	97-8	98-9	99-0
203.	SUNDERLAND		135	116	119	-	-						
204.	**SUTTON ##**		85	122	104	*15*	*41*					I	
205.	SWAMPSCOTT		48	39	47	*16*	*25*					I	
206.	SWANSEA	X	46	61	93	*53*	*35*						
207.	**TAUNTON**	x	79	104	100	*60*	*57*					I	
208.	TEWKSBURY		94	109	100	*38*	*44*					I	
209.	TISBURY		100	83	96	*20*	-						
210.	**TOPSFIELD**		105	131	0	-	-				I		
211.	TRURO		18	11	36	-	-						
212.	TYNGSBOROUGH ##		75	100	100	*14*	*39*					I	
213.	UXBRIDGE		93	101	104	*33*	*48*				I	I	
214.	**WAKEFIELD**		84	128	163	*31*	*39*				I	I	I
215.	WALES		96	84	86	-	-						
216.	**WALPOLE ##**	X	101	108	107	*18*	*33*				I		
217.	WALTHAM		88	78	117	*41*	*55*					I	
218.	WARE	X	80	66	65	*35*	*45*					I	
219.	WAREHAM	X	108	132	126	*52*	*54*				I		
220.	WATERTOWN ##	X	75	102	105	*29*	*38*					I	
221.	WAYLAND		66	119	103	*8*	*24*					I	
222.	WEBSTER		62	42	47	*56*	*61*						
223.	WELLESLEY		98	108	93	*4*	*20*					I	
224.	WELLFLEET		74	148	171	-	-						
225.	WESTBOROUGH		72	102	100	*11*	*28*					I	
226.	WEST BOYLSTON		0	0	47	*24*	*27*					I	
227.	WEST BRIDGEWATER		79	115	121	*25*	*42*					I	
228.	**WESTFIELD**		85	112	106	*47*	*62*					I	
229.	WESTFORD		87	66	78	*13*	*28*					I	
230.	WESTHAMPTON		3	87	0	-	-						
231.	WESTON	X	211	208	188	*9*	*13*						
232.	WESTPORT ##	X	82	140	96	*44*	*45*		I				
233.	**WEST SPRINGFIELD**		99	111	110	*37*	*57*					I	
234.	WESTWOOD ##	X	144	103	163	*10*	*24*			I		I	
235.	WEYMOUTH	X	135	110	111	*37*	*52*					I	
236.	WHATELY		163	139	0	-	-						
237.	WILLIAMSBURG		100	110	0	-	-						
238.	WILLIAMSTOWN		175	162	126	-	-					I	
239.	WILMINGTON		111	103	111	*30*	*43*					C	
240.	**WINCHENDON**		78	92	107	*41*	*67*					I	
241.	**WINCHESTER**		25	115	101	*9*	*17*				I		
242.	WINTHROP		91	128	152	*38*	*48*					I	
243.	WOBURN * ##		35	77	83	*25*	*45*					I	
244.	WORCESTER *	X	132	139	0	*57*	*64*					I	
245.	WRENTHAM	X	102	107	123	-	-					I	

District		PALMS	Per Pupil Professional Development Expenditures			1999 MCAS Mathematics Failure Rate		District Professional Development Plans on File					
			FY98 $75	FY99 $100	FY00 $125	Gr. 8	Gr. 10	94-5	95-6	96-7	97-8	98-9	99-0
246.	NORTHAMPTON SMITH ##		73	280	324	-	*81*						
247.	ACTON BOXBOROUGH	X	97	116	106	*6*	*17*						
248.	**ADAMS CHESHIRE #**	X	103	134	138	*37*	*54*					I	
249.	AMHERST PELHAM ##		72	70	70	*17*	*23*					I	
250.	**ASHBURNHAM WESTMINSTER**		70	122	114	*33*	*34*						
251.	ATHOL ROYALSTON		49	106	139	*45*	*64*					I	
252.	BERKSHIRE HILLS #	X	37	67	48	*26*	*33*					I	I
253.	BERLIN BOYLSTON		52	54	71	*13*	*34*					I	
254.	BLACKSTONE MILLVILLE ##		16	18	21	*27*	*46*					I	
255.	BRIDGEWATER RAYNHAM		75	82	100	*28*	*37*					C	
256.	CHESTERFIELD GOSHEN		26	98	92	-	-						
257.	CENTRAL BERKSHIRE	X	78	101	104	*35*	*49*					I	
258.	CONCORD CARLISLE	X	214	189	237	-	*17*					I	
259.	DENNIS YARMOUTH ##		70	84	101	*30*	*38*					I	
260.	DIGHTON REHOBOTH		70	70	81	*35*	*38*					I	
261.	**DOVER SHERBORN**		51	49	79	*7*	*18*					I	
262.	DUDLEY CHARLTON		44	90	135	*39*	*41*					I	
263.	**NAUSET**	X	92	121	192	*32*	*26*					I	
264.	FARMINGTON RIVER		61	69	73	-	-					I	
265.	**FREETOWN LAKEVILLE**		102	99	115	*50*	*53*					I	
266.	FRONTIER	X	106	110	110	*24*	*32*						
267.	GATEWAY	X	53	39	94	*41*	*59*					I	
268.	GROTON DUNSTABLE		73	70	74	*17*	*27*				I	I	
269.	GILL MONTAGUE	X	21	77	29	*28*	*50*					I	
270.	HAMILTON WENHAM		130	131	130	*8*	*21*					I	
271.	HAMPDEN WILBRAHAM ##	X	79	100	100	*21*	*34*					I	
272.	HAMPSHIRE	X	2	92	0	*25*	*27*					I	
273.	HAWLEMONT		33	79	145	-	-						

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			FY98 $75	FY99 $100	FY00 $125	Gr. 8	Gr. 10	94-5	95-6	96-7	97-8	98-9	99-0
274.	KING PHILIP	X	76	108	104	*20*	*38*						
275.	LINCOLN		152	118	116	-	*21*					I	
276.	SUDBURY #												
277.	MARTHAS VINEYARD		62	62	64	-	*45*						
278.	MASCONOMET		77	123	130	*18*	*24*					I	
279.	MENDON UPTON		67	137	132	*17*	*32*						
280.	MOUNT GREYLOCK	X	140	121	100	*29*	*41*						I
281.	**MOHAWK TRAIL**	X	40	99	99	*37*	*33*					I	
282.	NARRAGANSETT		77	84	103	*44*	*53*					I	
283.	NASHOBA		54	27	0	*18*	*35*						
284.	NEW SALEM WENDELL		115	145	147	-	-						
285.	NORTHBORO SOUTHBORO		126	45	61	-	*22*					I	
286.	**NORTH MIDDLESEX**		67	86	0	*26*	*45*						
287.	OLD ROCHESTER	X	113	113	167	*39*	*30*				I	I	
288.	**PENTUCKET**		76	67	66	*21*	*21*					I	
289.	PIONEER	X	111	149	165	*43*	*48*						
290.	QUABBIN		80	96	130	*27*	*49*				I		
291.	RALPH C MAHAR	X	42	50	49	*52*	*49*						
292.	SILVER LAKE	X	78	71	76	*32*	*40*					I	
293.	SOUTHERN BERKSHIRE ##	X	39	66	39	*34*	*69*						
294.	SOUTHWICK TOLLAND	X	63	65	75	*36*	*58*						
295.	SPENCER EAST BROOKFIELD		76	82	125	*47*	*51*					I	
296.	**TANTASQUA**		109	84	99	*30*	*50*					I	
297.	TRITON *		100	100	125	*27*	*48*	I					
298.	UPISLAND		107	100	113	*22*	-						
299.	WACHUSETT		85	104	100	*16*	*23*				I		
300.	QUABOAG		78	93	90	*58*	*55*					I	
301.	**WHITMAN HANSON ##**	X	48	62	59	*27*	*42*				I		
302.	ASSABET VALLEY		187	335	386	-	*78*				I		
303.	BLACKSTONE VALLEY		80	66	125	-	*75*						
304.	BLUE HILLS		152	145	150	-	*70*						
305.	BRISTOL PLYMOUTH		84	95	101	-	*83*				I		
306.	CAPE COD		118	118	112	-	*67*		I				
307.	FRANKLIN COUNTY	X	163	188	193	-	*73*				I		
308.	GREATER FALL RIVER		59	76	100	-	*85*						
309.	GREATER LAWRENCE		30	31	36	-	*90*				I		

District		PALMS	Per Pupil Professional Development Expenditures			1999 MCAS Mathematics Failure Rate		District Professional Development Plans on File					
			FY98 $75	FY99 $100	FY00 $125	Gr. 8	Gr. 10	94-5	95-6	96-7	97-8	98-9	99-0
310.	GREATER NEW BEDFORD	X	27	111	125	-	*85*				I		
311.	GREATER LOWELL		78	101	102	-	*89*						
312.	SOUTH MIDDLESEX		80	114	85	-	*85*						
313.	MINUTEMAN ##	x	123	151	163	-	*61*						
314.	MONTACHUSETT		98	128	122	-	*77*						
315.	**NORTHERN BERKSHIRE**		82	102	79	-	*60*					I	
316.	NASHOBAVALLEY		116	118	140	-	*86*						
317.	NORTHEAST METROPOLITAN		107	150	121	-	*85*						I
318.	NORTH SHORE ##		77	118	108	-	*70*						
319.	OLD COLONY ##		72	69	76	-	*72*					I	
320.	PATHFINDER		80	108	98	-	*80*						
321.	SHAWSHEEN VALLEY		73	98	103	-	*83*					I	
322.	SOUTHEASTERN		159	176	0	-	*81*					I	
323.	SOUTH SHORE		142	138	193	-	*74*					I	
324.	SOUTHERN WORCESTER		83	107	140	-	*78*						
325.	TRI COUNTY #		90	119	100	-	*74*						
326.	UPPER CAPE COD ##		124	128	100	-	*87*					I	
327.	WHITTIER		99	102	108	-	*89*					I	
328.	BRISTOL COUNTY #		93	102	101	-	*77*						
329.	ESSEX COUNTY		81	102	107	-	*78*					I	
330.	NORFOLK COUNTY		137	252	127	-	*67*						

Key

Boldface	Sample Survey Districts
*	EMAB audited districts
#	MDOE Coordinated Program Review provided to MTA through lawsuit discovery
##	MDOE reported CPR audit done in FY00; no report provided to MTA through lawsuit discovery
I	Incomplete district professional development plan
C	Complete district professional development plan

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